AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

ON THIN ICE: THE FUTURE OF THE POLAR BEAR

HEARING

BEFORE THE

SELECT COMMITTEE ON
ENERGY INDEPENDENCE
AND GLOBAL WARMING
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

JANUARY 17, 2008

Serial No. 110–22

Printed for the use of the Select Committee on
Energy Independence and Global Warming

globalwarming.house.gov

U.S. GOVERNMENT PRINTING OFFICE
58–416 WASHINGTON : 2010

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING

EDWARD J. MARKEY, Massachusetts, *Chairman*

EARL BLUMENAUER, Oregon
JAY INSLEE, Washington
JOHN B. LARSON, Connecticut
HILDA L. SOLIS, California
STEPHANIE HERSETH SANDLIN, South Dakota
EMANUEL CLEAVER, Missouri
JOHN J. HALL, New York
JERRY McNERNEY, California

F. JAMES SENSENBRENNER, JR, Wisconsin *Ranking Member*
JOHN B. SHADEGG, Arizona
GREG WALDEN, Oregon
CANDICE S. MILLER, Michigan
JOHN SULLIVAN, Oklahoma
MARSHA BLACKBURN, Tennessee

Professional Staff

David Moulton, *Staff Director*
Aliya Brodsky, *Chief Clerk*
Thomas Weimer, *Minority Staff Director*

CONTENTS

Page
Hon. Edward J. Markey, a Representative in Congress from the Commonwealth of Massachusetts, opening statement 1
  Prepared Statement 3
Hon. F. James Sensenbrenner, Jr., a Representative in Congress from the State of Wisconsin, opening statement 5
Hon. Earl Blumenauer, a Representative in Congress from the State of Oregon, opening statement 6
Hon. Greg Walden, a Representative in Congress from the State of Oregon, opening statement 6
Hon. Jay R. Inslee, a Representative in Congress from the State of Washington, opening statement 7
Hon. Marsha Blackburn, a Representative in Congress from the State of Tennessee, opening statement 8
Hon. John Larson, a Representative in Congress from the State of Connecticut, opening statement 9
Hon. Emanuel Cleaver II, a Representative in Congress from the State of Missouri, opening statement 9
Hon. John Hall, a Representative in Congress from the State of New York, opening statement 9

WITNESSES

Mr. H. Dale Hall, Director, Fish and Wildlife Service 11
  Prepared Statement 13
Mr. Randall Luthi, Director, Minerals Management Service (Accompanied By Mr. John Goll, Regional Director, Minerals Management Service, Anchorage, Alaska) 17
  Prepared Statement 20
Dr. Steven Amstrup, Polar Bear Team Leader, United States Geological Survey 28
Ms. Kassie Siegel, Director, Climate, Air and Energy Program, Center for Biological Diversity 44
  Prepared Statement 47
  Answers to Submitted Questions 150
Ms. Deborah Williams, President, Alaska Conservation Solutions 89
  Prepared Statement 92
  Answers to Submitted Questions 155
Ms. Jamie Rappaport Clark, Executive Vice President, Defenders of Wildlife .. 131
  Prepared Statement 134
  Answers to Submitted Questions 164

SUBMITTED MATERIALS

International Fund for Animal Welfare Report: On Thin Ice 169
Hon. Jay R. Inslee et al. letter of June 15, 2006 to Fish and Wildlife Service .. 209
Hon. Jay R. Inslee et al. letter of Feb. 16, 2007 to Fish and Wildlife Service ... 217
Hon. Jay R. Inslee et al. letter of April 9, 2007 to Fish and Wildlife Service 221
Hon. Jay R. Inslee et al. letter of June 29, 2007 to the Department of the Interior 227
Hon. Jay R. Inslee et al. letter of Oct. 22, 2007 to Fish and Wildlife Service 231
Hon. Jay R. Inslee et al. letter of Jan. 17, 2008 to Fish and Wildlife Service ... 238
Hon. Edward J. Markey and Hon. James Sensenbrenner, letter of Jan. 31, 2008 from Jason Patlis, World Wildlife Fund 242
Testimony of Margaret Williams, Managing Director, Kamchatka/Bering Sea Ecoregion Program, World Wildlife Fund before the Committee on the Environment and Public Works, U.S. Senate, Jan. 30, 2008 244

Page
Polar Bears at Risk, a WWF Status Report, May 2002 264
World Wildlife Fund, Polar Bear Fact Sheet, 2007 292

ON THIN ICE: THE FUTURE OF THE POLAR BEAR

THURSDAY, JANUARY 17, 2008

HOUSE OF REPRESENTATIVES
SELECT COMMITTEE ON ENERGY INDEPENDENCE
AND GLOBAL WARMING
Washington, DC

The committee met, pursuant to call, at 9:30 a.m. in Room 2175, Rayburn House Office Building, Hon. Edward J. Markey [chairman of the committee] presiding.

Present: Representatives Markey, Blumenauer, Inslee, Larson, Cleaver, Hall, Sensenbrenner, Shadegg, Walden and Blackburn.

Staff Present: Morgan Gray and David Moulton.

The CHAIRMAN. This hearing is called to order of the Select Committee on Energy Independence and Global Warming.

The impacts of global warming are often discussed in the future tense, but as we will hear today, the Arctic is already feeling the strain of the dangerous build-up of heat-trapping pollution in our atmosphere. Hardly a week passes without another discovery of new and accelerating ways that global warming is impacting the Arctic region, global warming's Ground Zero.

In the fall scientists reported that as a result of the warming planet, the 2007 summer Arctic sea ice melt was likely the greatest of the last century, an astonishing 23 percent greater than the previous record set in 2005. A recent study by scientists at the National Center for Atmospheric Research projected that the Arctic Ocean could be devoid of ice by 2040. Furthermore, Dr. J. Zwally, a leading NASA scientist, recently reanalyzed sea ice data and projected that the Arctic Ocean could be ice-free in summertime as early as 2012, just 4 short years from now.

The presence of Arctic sea ice is essential for many forms of animal and plant life, but particularly for the polar bear. Polar bears use these ice floes as a platform for nearly every aspect of their lives, including hunting their primary food source. The disappearance of sea ice as a result of global warming is leading to the very real possibility that polar bears will disappear as well.

The Bush administration's own scientists project that the prospects for the polar bear's survival are bleak. Last year Dr. Steven Amstrup, who is with us today, headed up a team of scientists charged with examining the impacts of sea ice loss on polar bear populations. In a series of reports released last fall, Dr. Amstrup's team concluded that by midcentury two-thirds of all the world's polar bears could disappear, and that polar bears could be gone entirely from Alaska. Dr. Amstrup's team also noted that based on recent observations, this dire assessment could actually be conservative.

The actions of the Bush administration in the coming months could very well determine the fate of this iconic animal. The Interior Department is currently considering whether to list the polar bear under the Endangered Species Act as a result of the impacts of global warming. Last week the Fish and Wildlife Service announced that it was going to delay any decisions to beyond its statutorily required deadline, meaning that legal protection for the polar bear would be put on ice, while its habitat continues to melt. Meanwhile, the Interior Department is revving up its regulatory machine to allow new oil drilling in sensitive polar bear habitat.

Earlier this month the Minerals Management Service finalized its plans to move forward next month with an oil and gas lease sale of nearly 30 million acres in the Chukchi Sea, an area that is essential habitat for polar bears in the United States. The timing of these two decisions leaves the door open for the administration to give Big Oil the rights to this polar bear habitat the moment before the protections for the polar bear under the Endangered Species Act go into effect.

Rushing to allow drilling in polar bear habitat before protecting the bear would be the epitome of this administration's backward energy policy, a policy of drill first and ask questions later. In this situation, as in many things in life, order matters. You don't put on your shoes before your socks. You don't start driving before looking at a map. You don't buy a Patriots Super Bowl shirt before the game. And we shouldn't be selling the drilling rights in this important polar bear habitat before deciding how we are going to protect them. It seems that every time there is a choice between extraction and extinction in this administration, extraction wins. This must not be the case for the polar bear.

[The prepared statement of Mr. Markey follows:]

THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

Opening Statement for Chairman Edward J. Markey
"On Thin Ice: The Future of the Polar Bear"
January 17, 2008

The impacts of global warming are often discussed in the future tense, but, as we will hear today, the Arctic is already feeling the strain of the dangerous buildup of heat-trapping pollution in our atmosphere. Hardly a week passes without another discovery of new and accelerating ways that global warming is impacting the Arctic region – global warming's ground zero.

In the fall, scientists reported that as a result of the warming planet, the 2007 summer Arctic sea ice melt was likely the greatest of the last century -- an astonishing 23 percent greater than the previous record set in 2005. A recent study by scientists at the National Center for Atmospheric Research (NCAR) projected that the Arctic Ocean could be devoid of ice by 2040. Furthermore, Dr. Jay Zwally, a leading NASA scientist recently re-analyzed sea ice data and projected that the Arctic Ocean could be ice-free in summertime as early as 2012 – just four short years from now.

The presence of Arctic sea ice is essential for many forms of animal and plant life, but particularly for the polar bear. Polar bears use these ice floes as a platform for nearly every aspect of their lives, including hunting their primary food source. The disappearance of sea ice as a result of global warming is leading to the very real possibility that polar bears will disappear as well.

The Bush Administration's own scientists project that the prospects for the polar bear's survival are bleak. Last year, Dr. Steven Amstrup, who is with us today, headed up a team of scientists charged with examining the impacts of sea ice loss on polar bear populations. In a series of reports released last fall, Dr. Amstrup's team concluded that by mid-century, two-thirds of all the world's polar bears could disappear and that polar bears could be gone entirely from Alaska. Dr. Amstrup's team also noted that based on recent observations, this dire assessment could actually be conservative.

The actions of the Bush Administration in the coming months could very well determine the fate of this iconic animal. The Interior Department is currently considering whether to list the polar bear under the Endangered Species Act as a result of the impacts of global warming. While this decision has been nearly three years in the making, last week the Fish and Wildlife Service announced that it was going to delay any decisions beyond its statutorily required deadline – that legal protection for the polar bear would be put on ice while its critical habitat continues to melt.

Meanwhile, the Interior Department is revving up its regulatory machine to allow new oil drilling in sensitive polar bear habitat. Earlier this month, the Minerals Management Service finalized its plan to move forward early next month with an oil and gas lease sale of nearly 30 million acres in the ChukChi Sea, an area that is essential habitat for polar bears in the United States.

The timing of these two decisions leaves the door open for the Administration to give Big Oil the rights to this polar bear habitat the moment before the protections for the polar bear under the Endangered Species Act go into effect. Rushing to allow drilling in polar bear habitat before protecting the bear would be the epitome of this Administration's backwards energy policy – a policy of drill first and ask questions later.

In this situation, as in many things in life, order matters. You don't put on your shoes before your socks. You don't start driving before looking at a map. You don't buy your Patriots Super Bowl shirt before the game. And we shouldn't sell the drilling rights in this important polar bear habitat before deciding how we are going to protect them. It seems that every time there is a choice between extraction and extinction in this Administration, extraction wins. That must not be the case for the polar bear.

The CHAIRMAN. Now I would like to turn and recognize the Ranking Member of the select committee, the gentleman from Wisconsin, Mr. Sensenbrenner for an opening statement.

Mr. SENSENBRENNER. Well, first of all, Mr. Chairman, what Patriot Super Bowl shirt? You are going to be wearing green and gold that day.

Now I will talk about the polar bears.

The polar bear is a majestic and fascinating creature that should be observed, admired and protected, and its habitat is declining. The price of crude oil is reaching $100 a barrel. The United States needs more and not less access to domestic oil and gas reserves. I am afraid that this hearing of a select committee charged with examining the nexus of energy independence and global warming, the polar bear simply is becoming a political tool, and that is a shame.

There has been some cynical speculation in the media and among some others that the polar bear is just a few decades from extinction, and the current administration is ready and willing to diminish the polar bear's plight in order to help the oil and gas industry. I believe nothing could be further from the truth. It is my hope that this hearing can help address some of these misconceptions.

Currently the administration is looking at two decisions that, while interrelated, are decided under two separate, distinct and different laws that support two different policy goals: protection of the polar bear and progress on energy and security through the development of domestic oil and gas reserves.

For more than a year, the Department of the Interior has been studying whether to list the polar bear as a threatened species under the Endangered Species Act. This is a complicated and nuanced question, but one whose answer must be based solely, and I emphasize solely, on the best scientific and commercial information about the polar bear.

If the scientists and wildlife managers at the Interior Department determine that the polar bear should be listed as a threatened species, then the United States should take all required steps under the Endangered Species Act to protect the polar bear. I note that regardless of whether the polar bear is listed under the Endangered Species Act, it is already protected under the Marine Mammal Protection Act.

The Interior Department's Minerals Management Service has also decided to move forward with an oil and gas lease sale in Alaska's Chukchi Sea, which is a part of the polar bear's habitat. Should the polar bear be listed, then oil and gas companies will have to take all appropriate efforts to ensure that their exploration and production are done in a manner required by the Endangered Species Act. The timing of these separate decisions is incidental to protecting the polar bear.

The hallmark of the Endangered Species Act is that listing decisions need to be based solely on sound scientific and commercial information and not politics. I worry that today's hearing will focus too much on the politics and not enough on the science, and that certainly isn't good news for either the polar bears or for America's energy security.

I yield back the balance of my time.

The CHAIRMAN. Great. The gentleman's time has expired.

The Chair recognizes the gentleman from Oregon, Mr. Blumenauer.

Mr. BLUMENAUER. Thank you, Mr. Chairman.

There is a rare area of complete agreement with my distinguished friend from Wisconsin as relates to the Super Bowl. I appreciate his elaboration.

I am very much appreciative of this hearing. I have a slight difference of opinion with my good friend from Wisconsin, however, in terms of what the significance of this is. I don't think it is incidental, and just because they are tracking under different laws is no reason that they cannot be harmonized.

Years ago I was involved with an effort that struck a raw chord in this country as we were trying to rescue polar bears from a circus environment in Puerto Rico where they were being abused. It is fascinating to me to watch the outrage and the activity that this engendered. People could sort of understand that. Now I look back and think of what is happening here today, because it is not just an individual circus in Puerto Rico, but we are talking about the Federal Government's action which actually might endanger and abuse not a handful of circus animals, but threaten the existence of polar bears in the wild.

This administration is dealing with activities that could potentially threaten the habitat of this magnificent animal, which is a critical part of a spectacular, but fragile ecosystem. It is stunning to think that the Federal Government, before considering whether or not the polar bear is endangered, would encroach upon almost half of its U.S. habitat.

Now, I personally think that we are smart enough to figure out how to harmonize these efforts and make a difference. The notion that it is our country that wouldn't take that extra step does give me pause. And frankly, the notion that this is incidental, I think in the course of the hearing it will be clear that it is not. We have an administration that has a record of taking small steps and driving forward. In effect, we are watching now throughout the Western United States where sportsmen are finding that—the consequence of the drill and dig and, as you were saying, Mr. Chairman, ask questions later.

I think there is no excuse for not taking a few additional weeks and doing this right. I deeply appreciate your scheduling this hearing. The fact that I am not here for all of it is not a reflection on its importance, but we have Mr. Bernanke before the Budget Committee, and I am obligated to be across the street. But I will be with you, I will be following up, and I do appreciate it.

The CHAIRMAN. I thank the gentleman very much.

The CHAIRMAN. The Chair recognizes the gentleman from Oregon, Mr. Walden.

Mr. WALDEN. Mr. Chairman, thank you. I look forward to reading the testimony of the witnesses and hearing from them, so I will keep my remarks brief. We also have an Energy and Air Quality Subcommittee hearing with Chairman Connaughton on his testimony in Bali that starts in about 17 minutes, so I will have to depart for that as well.

I know this is a serious issue, and I look forward to hearing the scientific evidence involved here. I also know that consumers are getting a little tired of $4 gas or $3.15 gas, and natural gas is certainly going up in price, the rise of fertilizer costs for the farmers I represent and drives industry offshore. I want to see America become energy independent, but in an environmentally sensitive way. So hopefully we can find a balance here that works for the country, for the polar bears and for the consumers.

Thank you, Mr. Chairman.

The CHAIRMAN. I thank the gentleman. Your time has expired.

The Chair recognizes the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Well, this we know: This is the last chance for the polar bear. They will never get another chance, and neither will we.

And I was thinking about why people feel so strongly about this issue. I was thinking about a woman named Helen Thayer, who was the first woman ever to ski alone to the North Pole. She was stalked for 2 days by a polar bear; she could have been an hors d'oeuvre for a polar bear.

I was thinking why do we have such admiration, respect and love for this species when they at times could make us a snack? And I think there is an obvious and an unobvious reason for that. The obvious reason is because they are so beautiful and magnificent, their ability to turn ultraviolet light into thermal energy. They are just beautiful.

I think there is a deeper reason that Americans feel so passionately about that, and that is that they realize that the polar bear is the largest canary in the largest coal mine in the world, and that it is not just the polar bear at risk from this threat of global warming, but we are at risk of the threat of global warming.

When people think—and I think the reason they care so much about this is they recognize that you don't cry for the bell tolling over the bear; we can ask, why is the bell tolling for us, because that is what is happening here. People recognize that, that a polar bear without an ice cap is a fisherman without a boat, and that is tough on the polar bear; but a world without an ice cap is a world without a thermal regulator.

Just hold up this poster here. This shows the sea ice of 2000, the ice cap in the summer, and at the latest when it will disappear and be gone in 2040. And the reason people care so much about the polar bear is they realize its demise is inextricably related with ours, because this is a thermal regulator for the world's climate. And when we lose that ice cap, we lose a cap that radiates energy back into the Earth, and now the ocean starts to absorb six times more energy than the world did in northern climes, which puts us at risk, not just the polar bear.

So I am disturbed that this administration continues on a path of willful ignorance and habitual arrogance. It is willfully ignorant to go forward with allowing the leasing in this area immediately adjacent to the habitat, willfully ignoring science, willfully refusing to ask these questions before these decisions are made, and habitually being arrogant that oil surpasses all other forms of human value. So I hope that this hearing will convince the administration to rethink its position on this, ask the hard questions, get the scientific answers before we take this leap.

And just on one parting note, and this is kind of how I feel about this, if you look over at these kids sitting over here, I don't know where they are from, all I know about them is that they are beautiful, and they look smart as a tack. And what we are doing here today is basically saying when they are our age, they will have polar bears around, and they should have an ice cap to make sure that their planet doesn't warm up. So these kids, I hope you enjoyed today, and I hope this administration is thinking about you when they make these decisions. Thank you.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentlelady from Tennessee, Mrs. Blackburn.

Mrs. BLACKBURN. Thank you, Mr. Chairman. I thank you for holding the hearing, and I want to thank our witness for taking their time to come and be with us today and share their information.

We all know that the Department of the Interior is currently considering a plan to list polar bears as a threatened species under the Endangered Species Act, and a basic question needs to be answered before we take such an action, and it is this: Are current polar bear populations sustainable, are they even sustainable?

This committee has called this hearing because some scientists think that they have the answers to this question. They say that the polar bear population is decreasing, and global warming is causing the decline, and that is going to lead to their extinction. However, could it be, could it be that their conclusions are based on speculative and hypothetical conjecture that relies on climate modeling methods that have been shown to be statistically inaccurate in predicting past and present climate change? Is that a possibility for us? To rely on these error-prone models to predict the survival of a species 40 or 50 years from now does not withstand the most basic scientific scrutiny, so we need to think about this one.

Studies done by the World Wildlife Fund, Canadian biologists and American climatologists are in direct contradiction to the claims of some of these scientists. These studies found that almost all, almost all, of the Arctic populations of polar bears are either stable or increasing, and that changing wind patterns are the primary causes of changing sea ice distributions, not global warming.

One of the most interesting findings in these studies is that data shows polar bear populations are increasing in warming areas and declining in cooling areas.

Mr. Chairman, the most available, incredible information on the status of the polar bear population indicates that listing the species as threatened could possibly be unwise. It might be misguided. Instead I think we need more studies to obtain precise and accurate measurements of population trends and ecosystem factors. The data could then be used to determine what best practices of conservation and management should be applied to maintain a sustainable polar bear population. I hope we will explore that issue and be able to arrive at some data that will give us better guidance.

I yield the balance of my time.

The CHAIRMAN. The gentlelady's time is expired.

The Chair recognizes the gentleman from Connecticut, Mr. Larson.

Mr. LARSON. Thank you, Chairman Markey. Let me put my plug in immediately for the New England Patriots, and I do think we will be wearing the silver and blue in celebrating.

But let me associate myself with the remarks of my colleagues here, and specifically I am so pleased to see as well that we have so many young people in the audience today, because, as Mr. Inslee has said, this is about you, it is about our planet. I think of Teddy Roosevelt, that great, robust President who cared deeply about this country, its environment. I think of the bald eagle as our national symbol that almost was extinct. Today we have discussion over the issue of polar bears, who symbolically represent so much of the last vestige of the wild world in the North.

And so I think it is important that kids are here today, because they not only get to hear the science and the facts, but they get to see their democracy in action, and they are stewards of the democracy of the future. And so you get to weigh the discussions and the arguments and the data and information that you hear from our experts, and then ultimately you get to decide as well. That is how our democracy works.

It is interesting to see, I am sure, for you that there are differences of opinion when it comes to preserving our environment and making sure that we give the appropriate status to endangered species like the polar bear.

Thank you, Mr. Chairman. I yield back.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentleman from Missouri, Mr. Cleaver.

Mr. CLEAVER. Thank you, Mr. Chairman.

I must express some resentment at those of you speaking about the Super Bowl. In fact, I think we need to have some congressional hearings. Just because the Kansas City Chiefs lost the last nine games, there is no reason to prevent them from playing in the Super Bowl. I just don't think this is democracy.

The CHAIRMAN. The polar bears of the NFL.

Mr. CLEAVER. Yeah.

Thank you, Mr. Chairman.

A short statement, and I am interested in the opinions of the witnesses. The strange thing about all of this is even if we don't drill in Alaska, I think most of the scientific community would agree that continuing to burn fossil fuel does, in fact, put more greenhouse gases into the atmosphere, and if there are more greenhouse gases in the atmosphere, the temperature the Earth will rise. If the temperature the Earth rises, the ice will melt. And so I think that even if you don't want to accept this as a current problem, just accepting the fact that fossil fuel creates greenhouse gas shows that there is a problem.

And I guess the delight for me today is that one of the polar bears came in, and they think that it is wrong to drill.

Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentleman from New York, Mr. Hall.

Mr. HALL of New York. Thank you, Mr. Chairman. And thank you for holding this hearing.

I also believe that the polar bears are an iconic species, which people may not think that it directly affects human existence. But it is important to me and, I think, important to many of us and the children who are here today, those with imagination and appreciation and love for the nature that the Creator left us in a position of responsibility to protect and to guard, that species like the polar bear are allowed a chance to continue to have a habitat and to live. They are indeed part of the fabric of the ecological net that we also are a part of, and that one by one as the species that are threatened today are removed by continued excessive consumption and pollution, that net becomes more and more fragile and fragile to humans.

Yesterday we had a meeting about the Tappan Zee Bridge with some of the representatives from New York and the New York State Department of Transportation commissioner, and I asked her, among other things, because the bridge is probably going to be rebuilt because it is deficient and aging—because of the bridge collapse in Minnesota, and everybody is thinking about other bridges that might be weak and need to be replaced, I asked her are they planning on building it higher because of the possibility of sea level increase, because the Hudson River which splits my district is tidal all the way to Troy, which is north of Albany, New York. In other words, if the sea level increases, the Hudson River level will increase, and that will affect things like the bridge, things like the rail—the freight rail line, and the west shore of the Hudson, and the passenger rail line and east shore of the Hudson that are only a few feet above sea level now, and if we have a significant increase in sea level and more frequent and more strong storms as a result, that these things will have a direct impact on people living in my district and on the economic life and investments that have already taken place in refurbishing waterfronts and building walkways, and boardwalks, and new restaurants and shops along these newly improved downtown waterfronts.

Now, that might seem like a long cry, a far reach from a polar bear, but it is only one of the many ways that I believe we need to connect what is going on, the changes. I am looking at one of our witnesses' testimony, the difference between ice pack in September of 1979 and the ice pack in September 2007, and it is a significant reduction. I just don't think that we can wait to make the changes.

The changes we need to make to save the polar bear are the same changes we need to make to stop asthma and emphysema from being such an epidemic in our inner cities and among our children; the same changes we need to make to save our balance and trade deficit from being worse; the same changes we need to make to stop shipping billions of dollars to oil states and unstable parts of the world and borrowing the money from other countries, including China, to pay for it. They are the same changes that are driving us into a loss of sovereignty and at the same time destroying our environment.

And so that is a lose-lose-lose-lose energy policy. The policy that would change that and solve those problems is a win-win-win-win policy in which we create new technologies, new industries, jobs here in this country; keep our money at home; keep our children and elderly from suffering the effects of asthma and emphysema; cut back on oil spills, acid rain and other detrimental effects of fossil fuel consumption.

So I am here to hear the witnesses. I have used up all of my time ranting. I thank you, Mr. Chairman, for holding this hearing.

The CHAIRMAN. The gentleman's time has expired, and all time for opening statements from Members has expired. So we turn to our panel. Our first witness is Mr. Dale Hall, who is the Director of the United States Fish and Wildlife Service. Mr. Hall has spent the majority of his life in public service. Over the course of Mr. Hall's three decades with the U.S. Fish and Wildlife Service, he has played an important role in developing our Nation's fishery facilities.

We welcome you, sir. Whenever you are ready, please begin your testimony.

STATEMENTS OF H. DALE HALL, DIRECTOR, FISH AND WILDLIFE SERVICE; RANDALL LUTHI, DIRECTOR, MINERALS MANAGEMENT SERVICE; AND STEVEN AMSTRUP, POLAR BEAR TEAM LEADER, U.S. GEOLOGICAL SURVEY

STATEMENT OF H. DALE HALL

Mr. HALL. Thank you, Mr. Chairman, Ranking Member Sensenbrenner and members of the select committee. It is a pleasure to be here with you this morning.

Mr. Chairman, I have requested my written statement be entered into the record.

The CHAIRMAN. Without objection, it will be included in the record at the appropriate point.

Mr. HALL. Thank you, sir.

The Service proposed to list the polar bear as threatened throughout its range on January 9th, 2007, after a scientific review of the species found that populations may be threatened by the receding sea ice. Polar bears use sea ice as a platform for many activities essential to their life cycle, especially hunting for their main prey, Arctic range seals.

At the time Secretary Kempthorne announced the proposal, he directed us to work with the USGS, the public, and pertinent sectors of the scientific community to broaden our understanding of what factors affect the species to gather additional information to inform the final decision on whether the species warrants Federal protection under the ESA.

To assist in that effort, we opened a 3-month public comment period and held public hearings in Anchorage and Barrow, Alaska, and Washington, D.C. In June 2007, we hosted a meeting that included official representatives from all of the countries within the polar bear's range. The meeting provided a forum for the exchange of scientific, management and technical information among the range nations.

In September 2007, USGS scientists supplied their new research to the Service, updating population information on polar bears in the Southern Beaufort Sea of Alaska, and providing new information on the status of two other polar bear populations. USGS studies provided additional data on Arctic climate and sea ice trends and projected effects to polar bear numbers throughout the species' range.

As a result of the new USGS research findings, we reopened and later extended a second comment period to allow the public time to review and respond to the USGS reports. We received numerous comments on the USGS reports and have been working to analyze and respond to the information provided during the extended comment period. We expect to provide a final recommendation to the Secretary and finalize a decision on the proposal to list the polar bear in the very near future.

Part of today's hearing focuses on the possible oil and gas development activities occurring in polar bear habitat. As we noted in our January 9 proposed rule, the Service determined that these activities do not threaten polar bears throughout all or a significant portion of their range after review of factors including the mitigation measures required under the Marine Mammal Protection Act; historical information on development activities; lack of direct, quantifiable impacts to habitat from these activities noted to date; the localized nature of the development activities or possible events such as oil spills.

In particular, the incidental take provisions of the Marine Mammal Protection Act ensure that any impacts on the species will be negligible and will not have an unmitigable impact on the availability of the species for subsistence use by Alaska Natives.

I look forward to working with you as we move forward in this process, and I look forward to working with all of the entities, including the State of Alaska, other Federal entities, the Congress, international community and others, as we work to conserve this very important species.

Thank you, Mr. Chairman.

The CHAIRMAN. I thank you, Mr. Hall, very much.

[The statement of Mr. Hall follows:]

TESTIMONY OF H. DALE HALL, DIRECTOR, U.S. FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR, BEFORE THE U.S. HOUSE OF REPRESENTATIVES SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING ON POLAR BEARS AND MINERAL LEASING ON THE OUTER CONTINENTAL SHELF IN ALASKA

January 17, 2008

Chairman Markey, Ranking Member Sensenbrenner, and Members of the Select Committee, I am H. Dale Hall, Director of the U.S. Fish and Wildlife Service (Service), and I appreciate the opportunity to testify today before you regarding both the proposal to list the polar bear as threatened under the Endangered Species Act (ESA) and the current protections Federal law provides polar bear under laws such as the Marine Mammal Protection Act (MMPA).

As Committee Members are aware, on January 9, 2007, the Service proposed to list the polar bear under the ESA as "Threatened" throughout its range after a scientific review of the polar bear found that populations may be threatened by receding sea ice habitat. Polar bears use sea ice as a platform for many activities essential to their life cycle, especially hunting for their main prey, arctic seals.

Under the ESA, a species may be a threatened or endangered species based on one or more of the following five factors:

- Present or threatened destruction, modification or curtailment of its habitat or range;
- Overutilization for commercial, recreational, scientific or educational purposes;
- Disease or predation;
- Inadequacy of existing regulatory mechanisms; or
- Other natural or manmade factors affecting its continued existence.

This determination is to be based on the best scientific and commercial data available. The determination may be based on any of these factors or a combination of the factors. The ESA does not discriminate between natural or manmade causes.

At the time Secretary of the Interior Dirk Kempthorne announced the proposal, he directed the U.S. Geological Survey (USGS) to perform new research aimed at filling specific knowledge gaps pertinent to our process of moving from a proposed rule to a final rule. The Secretary also directed the Service to work with the public and pertinent sectors of the scientific community to broaden our understanding of what factors affect the species and to gather additional information to inform the final decision on whether the species warrants Federal protection under the ESA. The Service opened a three-month public comment period and held public hearings in Anchorage and Barrow, Alaska and Washington D.C. In June 2007, the Service hosted a meeting of countries that are part of the polar bear's range that included official representatives from the United States, Canada, Norway and Russia. Greenland, which is part of Denmark, was also represented. The meeting provided a forum for the exchange of scientific, management and technical information among the range nations.

In September 2007, USGS scientists supplied their new research to the Service. This research developed ecoregions for polar bears and determined how the observed and projected changes in sea ice translate into changes in polar bear habitat availability. It updated population information on polar bears of the Southern Beaufort Sea of Alaska, and provided new information on the status of two other polar bear populations. USGS studies also provided additional data on arctic climate and sea ice trends and projected effects to polar bear numbers throughout the species' range over various time periods and scenarios of projected trends.

As a result of the new USGS research findings, the Service reopened and later extended a second comment period, which closed on October 22, 2007, to allow the public time to review and respond to the USGS findings. At the time the decision was made to reopen and extend the comment period, I alerted the Department that the Service might need extra time to adequately evaluate and incorporate results from the comments received. The Service received numerous comments on the USGS reports and has been working to incorporate the USGS findings as well as to analyze and respond to the information provided during this extended comment period.

The Service expects to provide a final recommendation to the Secretary of the Interior and finalize the decision on the proposal to list the polar bear under the ESA in the near future.

Part of the discussion today centers on possible oil and gas development activities occurring in polar bear habitat. As the Service noted in its January 9 finding and proposed rule, a review of various factors led to a determination that these activities do not threaten polar bears throughout all or a significant portion of its range. These factors included: (1) mitigation measures in place and likely used in the future, including mitigation measures required under the Marine Mammal Protection Act (MMPA); (2) historical information on development activities; (3) the lack of direct, quantifiable effects to habitat from these activities noted to date; and (4) because of the localized nature of development activities or possible events such as oil spills.

Existing regulations and authorizations under MMPA that have been issued to oil and gas operators contain mitigation measures to ensure that any adverse effect on polar bears will be limited strictly to low levels, monitored, and reported. These protections are reviewed at five-year periods, at a maximum, to ensure mitigation measures are updated, as needed. In particular, the incidental take provisions of the MMPA ensure that any population-level effects on the species will be negligible and will not have an unmitigable negative effect on the availability of the species for subsistence use by Alaska Natives.

The Department also prepares an Environmental Impact Statement (EIS), under the National Environmental Policy Act and Departmental policy, which serves to evaluate the potential effects of exploration and development activities that could result from a lease sale. The EIS process incorporates extensive coordination with the State and local agencies, Alaska Natives, and other Federal agencies. Other consultations and reviews occur under many other authorities including, for Outer Continental shelf lease sales, the Magnuson-Stevens Fishery Conservation and Management Act and the Coastal Zone Management Act.

Conclusion

In conclusion, I look forward to working with you as we move forward on this important issue. The Service recognizes that the polar bear faces significant challenges across its range, but we will continue to work with all stakeholders, including the State of Alaska, Native Alaskans, industry, the sporting and conservation communities and foreign governments to conserve the polar bear throughout its range. I appreciate the opportunity to be here today and am happy to answer any questions you may have.

The CHAIRMAN. Our second witness is Mr. Randall Luthi. He is the Director of the Minerals Management Service in the Department of Interior. Mr. Luthi previously served as speaker of the Wyoming House of Representatives.

We welcome you, sir. Whenever you are ready, please begin.

STATEMENT OF RANDALL LUTHI

Mr. LUTHI. Thank you, Mr. Chairman, and thank you, members of the committee, Ranking Member Sensenbrenner. It appears right now as I have listened to the opening statements what we all agree on is we are glad you had this hearing. It will be interesting as we go through and listen to the various opinions that are expressed today.

I want to take an opportunity to let you know of our activities of dealing with the Chukchi Sea and the Alaskan Outer Continental Shelf. And from the very beginning, from the outset——

The CHAIRMAN. Could you turn on your microphone? I am sorry. I am not sure it is on.

Mr. LUTHI. I am sorry that all those witty comments were lost.

Once again, let me state at the outset that the MMS has worked closely with our sister agency, the Fish and Wildlife Service, throughout this process. This partnership is focused on protecting wildlife in the environment as we conduct an offshore energy program. We believe that energy resource development can be achieved consistent with the stewardship responsibilities, and believe me we take those stewardship responsibilities seriously.

The Department of the Interior and its agencies, including the Minerals Management Service, are public stewards of our Nation's natural resources. We also play an extremely vital role in the domestic energy development. One-third of all energy produced in the United States comes from resources managed by the Department of the Interior, both onshore and offshore. Our National security, our economy and our quality of life are dependent upon energy.

Last week we issued a Record of Decision to move forward with alternative energy development in the Outer Continental Shelf, which will help us as a Nation expand our use of renewable energy resources. This represents an important milestone in charting a course designed to increase our energy security through the development of a variety of resources, and that is so important at this time in our lives.

May I have the first slide, please? And you have it up.

This just gives us an idea of what we are looking at. This is a slide from the EIA. You will notice our U.S. consumption of energy is expected to continue to increase. It appears that our U.S. production is also going to increase, but at a lower rate. What that means is we import energy, we import energy. Most of that energy is going to be oil and gas that we import.

It is projected that we are going to see gasoline—an average gasoline price of $3.50 by this spring. It is unheard of a few years ago, but we now flirt with $100-a-barrel oil. It is projected that our increase in our demand for energy will increase by 24 percent by the year 2030, and during that same total period of time, as the chart indicates, our domestic energy will not significantly increase.

Currently the gap, as I have mentioned, in this import and our demand are filled by energy imports. In 2006, we imported 10 million barrels of oil and nearly 11½ million cubic feet of natural gas. It is predicted by 2030 an additional 1.9 million barrels of oil and 1.6 million cubic feet of gas per day is going to be above our current levels.

Next slide, please.

When we look at emerging economies—and this next slide takes a look at what the world consumption of energy is predicted to be. And once again, we are used to the idea that when we needed imports, we could get them. I think we are facing the possibility that that is going to be more and more difficult to do as you look at the great amount of energy the world is looking at.

We think it is important that as part of or energy resource portfolio, that we continue to develop those natural resources. In fact, the EIA once again predicts no matter what we do in the next generation, the generation that we have talked about already this morning, we are going to rely largely upon the traditional forms of energy; that is, coal, oil and gas. It is my belief that we need to work with those resources as well as alternative resources to reduce our energy independence.

Let us take a minute to look at the Chukchi Sea. Chukchi Sea sale is one of four areas that we have included in our 5-year leasing program. Between 1988 and 1991, there were four lease sales in the Chukchi Sea area; 483 blocks were leased, 5 exploration wells were drilled, and all of those wells indicated the presence of some oil and gas. We estimate that this area contains approximately 15 billion barrels of oil and 76 trillion cubic feet of gas.

This process, as we go through a sale, includes consultations and conferences with the Fish and Wildlife Service and the National Marine Fishery Service under the Endangered Species Act, as well as the Marine Mammal Protection Act. Both of those agencies issued no jeopardy biological opinions.

These reviews went to the potential direct, the indirect and the cumulative effects of the lease sale on marine mammals, including polar bears, as well as subsistence activities.

Mr. Chairman, to use your analogy, we believe that we have put on our underwear first, our T-shirt, our socks, our shirt, our pants and then our shoes, and lastly the belt. We think we have done a good job in making sure we understand the potential effects of this sale.

If you go back to the last slide, please, that gives you an idea of some of the things we have done on this slide. What the slide indicates there, if you will look at that, that is the coast of Alaska. That narrow white line is the State land, submerged lands. The next blue line is the area originally included in the sale, the proposal, as well as that pink.

What we did after consultations of the Fish and Wildlife Service as well as the Native groups, we reduced the size of the sale back to the green line, so that means at least 25 to 50 miles offshore, which is important critical habitat for beluga whales, for migratory birds, as well as the polar bear. In addition, that area that is shaded there would indicate that if any leases were leased in that area, they would have additional restrictions regarding exploration and development in order to protect natural resources.

MMS has an important role in providing information. In the last 30 years we have provided nearly $300 million of funding to study natural resources in the offshore of Alaska, including the polar bear.

Mr. Chairman, I see that my statement goes on much longer than the stop light does, and again, having been somewhat in your seat at a smaller level, I understand the importance of trying to move this along. I would ask, however, that my full written statement be included in the record. I look forward to attempting to answer questions that the committee might have.

The CHAIRMAN. I thank you, Mr. Luthi, and your entire statement will be included in the record. We thank you.

[The statement of Mr. Luthi follows:]

TESTIMONY OF RANDALL LUTHI, DIRECTOR, MINERALS MANAGEMENT SERVICE UNITED STATES DEPARTMENT OF THE INTERIOR BEFORE THE HOUSE SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING OVERSIGHT HEARING ON POLAR BEAR HABITAT LOSS AND THE CHUKCHI SEA OUTER CONTINENTAL SHELF LEASE SALE

JANUARY 17, 2008

Mr. Chairman and Members of Committee, thank you for the opportunity to discuss the Department of the Interior's role in managing energy production on the Chukchi Sea, in the Alaskan Outer Continental Shelf (OCS), and how the Minerals Management Service (MMS) is working under the OCS Lands Act to promote environmentally responsible energy development, in particular our efforts regarding polar bears.

Introduction

The MMS works closely with the U.S. Fish and Wildlife Service (FWS) to ensure the protection of wildlife and the environment as offshore energy development activities take place both in Alaska and elsewhere. The Department of the Interior and its agencies, including the MMS, are public stewards of our nation's natural resources. The Department also plays a vital role in domestic energy development, as one third of all energy produced in the United States comes from resources that it manages. In our view, energy resource development can be achieved consistent with our ongoing stewardship responsibilities, which we do take seriously.

The Need for Energy Security

Our nation's security, economy, and quality of life are dependent on adequate and affordable supplies of energy. Just last week, MMS issued its Record of Decision to move forward with alternative energy development on the OCS, an action that will assist in expanding utilization of renewable energy resources in the United States. This represents an important milestone in charting a course designed to increase our energy security through the responsible development of a diverse variety of resources, and it comes at a critical point in time. Today, we are experiencing a scenario that few envisioned just a few years ago – $100 a barrel oil. In its Short-Term Energy Outlook (January 2008), the Energy Information Agency projects that the average price for gasoline will climb to nearly $3.50 a gallon by this spring. Largely as the result of our expanding economy, according to the EIA's Annual Energy Outlook 2008 (Early Release), by 2030 our demand for energy will have grown by nearly 24 percent, at an annual average rate of 0.9 percent per year, even with improvements in our energy intensity—the amount of energy consumed per unit of GDP—that will be delivered by our increased emphasis on conservation and efficiency. During the same period, total domestic energy production is projected to increase at a slightly slower rate, even though production from renewable energy sources is expected to see significant growth.

Currently, the gap between demand for energy and domestic production is met by energy imports. In 2006, the United States imported over 10 million barrels of crude oil per day and nearly 4.2 trillion cubic feet of natural gas for the year. By 2030, the EIA projects that imports will be needed to meet 29 percent of total U.S. energy needs, down from 30 percent in 2006. We must keep in mind that, because the nation's consumption of energy will be increasing, in 2030, an additional 1.7 million barrels of crude oil per day and 0.6 trillion cubic feet of natural gas above 2006 levels would have to be imported to meet that projected growth.

Concern only increases when we look at forecasts of the world energy picture. According to EIA's International Energy Outlook 2007, world demand for energy is projected to grow at an average rate of up to 1.8 percent per year through 2030. With emerging economies, such as India and China, the competition for energy supply will only increase. To assure our energy and economic security, domestic energy production from all sources must increase.

The EIA also projects that the energy we use in the next 20 years will still be heavily dependent on traditional energy sources – coal, oil and gas. For example, as of 2005 approximately 97% of the fuel used by on-road vehicles was gasoline and diesel. Growing the use of alternative transportation fuels, such as ethanol, is a top priority for the Administration. However, it is important to recognize the enormity of the transformation that the President has called for with his proposal to reduce gasoline consumption by 20 percent over 10 years. Dramatic reductions in fossil fuel consumption by automobiles will not occur overnight. In this sense, while it is clearly important to pursue energy from alternative and renewable resources and increase conservation and efficiency, any realistic solution to increase our energy security must also focus on increased domestic production of coal, oil, and natural gas.

OCS Role in Our Nation's Energy Portfolio

Today, MMS administers about 7,800 leases and oversees nearly 4,000 facilities on the OCS. The EIA's reports indicate that if the Federal OCS were treated as a separate country, it would rank among the top five oil and gas producing nations in terms of the amount of crude oil and second in natural gas it supplies for annual U.S. consumption. The data shows a trend of increasing oil production from the OCS, which in 2006 produced about 498 million barrels per year, and by 2015 is projected to produce approximately 838 million barrels per year. The EIA also projects OCS natural gas production to increase from 2.7 trillion cubic feet per year in 2006 to 4.04 trillion cubic feet by 2015 and increase to 4.25 trillion cubic feet by 2020. Much of the future United States oil and gas demand will have to be met by OCS production, especially from new areas in the Gulf of Mexico and Alaska. MMS's 2006 resources assessment estimates the Alaska Planning Areas that are proposed for leasing in our 2007 to 2012 5-Year Oil and

Gas Leasing Program to contain undiscovered and technically recoverable resources of approximately 25 billion barrels of oil and 114 trillion cubic feet of natural gas.

As required by law, MMS provides an orderly and predictable schedule of competitive oil and gas lease sales. Production from leases issued as a result of these sales will contribute substantially to future domestic oil and gas production and will provide bonuses, rentals and royalties to the United States Treasury and adjacent coastal states. For example, in FY 2007, MMS collected $11.4 billion on behalf of the Federal government in royalties, rents, and bonuses.

The Chukchi Sea Planning Area

The Chukchi Sea is one of 12 OCS Planning Areas off the coast of Alaska. It is one of four Alaska Planning Areas included in the current 2007-2012 5-Year Oil and Gas Leasing Program.

The Chukchi Sea, in the Arctic Ocean, separates Alaska's northwest coast from Russia's northeast coast and has seen minimal oil and gas development activity. Yet, MMS's 2006 OCS National Assessment estimates that the Chukchi Sea Planning Area could hold 15 billion barrels of oil and 76 TCF of natural gas (mean, undiscovered, technically recoverable), thus providing potentially significant future production of oil and gas from Northern Alaska.

Between 1988 and 1991, portions of the current Chukchi Sea Planning Area were involved in four lease sales (Sales 97, 109, 124 and 126); 483 blocks were leased for a total of over $500 million in high bids. Five wells were drilled between 1989 and 1991, all safely, and all with some oil or gas shows. At the time, although very attractive geologically, companies decided to postpone further exploration of the area due to high costs associated with such activity.

Proposed Chukchi Sea Sale 193

The Chukchi Sea was included in both the 2007-2012 Oil and Gas Leasing Program as well as the current Program for 2002-2007. Both 5-Year Programs were developed under the statutory requirements of the OCS Lands Act, which included preparing comprehensive environmental impact statements. Under those processes, the bureau solicited comment from other Federal and State agencies and the public, and held hearings in the local communities. For both 5-Year Programs, the Governor of Alaska supported holding lease sales in the Chukchi Sea.

Sale 193 was originally scheduled for June 2007, but we delayed the sale until February 2008 to provide sufficient time to complete the environmental analyses, which included an environmental impact statement under the National Environmental Policy Act (NEPA), and consultations with the Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA), where both agencies issued "no jeopardy" biological opinions. Our analyses also included coordination with local governments and Federally-recognized tribes and compliance with statutes such as the OCS Lands Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the Coastal Zone Management Act. Through these reviews, we assessed the potential direct, indirect, and cumulative effects of the lease sale on marine mammals, including polar bears, and subsistence activities.

The MMS and the FWS have continued to work closely together, particularly in Alaska, to assure that energy development has little or no negative effect upon wildlife resources. As a result of the careful environmental analysis we prepared, which considered an area of 34 million acres, the Secretary and I decided to increase the size of the coastal buffer, limiting the sale area to under 30 million acres. The sale area now excludes nearshore waters ranging from about 25 to 50 miles from the coast. The near-shore "polynya" through which the bowhead and beluga whales, other marine mammals, and marine birds migrate north in the spring, and in which local communities subsistence hunt, are part of the excluded area.

As part of our comprehensive regulatory program, leases issued from the sale will include stipulations for protection of biological resources, including marine mammals and migratory and other protected birds, and methods to minimize interference with subsistence hunting and other subsistence harvesting activities. The Governor of Alaska concurred with the sale and the State agrees that it is consistent with its Coastal Zone Management (CZM) Plan.

MMS included items specific to polar bears in its "Information to Lessees" (ITL) issued for Sale 193. These items direct lessees to:

- obtain authorization under the Marine Mammal Protection Act (MMPA) from the FWS prior to any commencing operations; and
- coordinate with FWS and local Native communities while planning their oil and gas development activities and before submission of their Oil-Spill Response Plans to ensure potential threats to polar bears are adequately addressed based on the most current knowledge;
- conduct their activities in a way that will limit potential encounters and interaction between lease operations and polar bears.

As noted above, MMS's decision to conduct this sale was made after consideration of a large amount of information garnered from numerous environmental analyses and studies. Over the last 30 years, MMS has provided nearly $300 million in funding to study the offshore areas in Alaska, and more studies are planned for the current fiscal year. In fact, MMS has spent almost $2 million dollars over the past five years in targeted research to further our understanding of polar bear life history, feeding behaviors, use of sea-ice habitat, population and recruitment dynamics, development of new technology for locating and mapping polar bear travels and maternal dens, best practices for operations in polar bear habitats, and monitoring needs. Other MMS studies indirectly help to better understand polar bears by gathering information on animal species that are food for the bears, oil spill modeling and response capabilities, and changes in sea-ice conditions. These studies complement the research supported by other Federal and State agencies and non-government organizations, and significantly add to the information base on polar bears in the Beaufort and Chukchi Seas.

Overall, MMS is a leading participant and supporter of scientific research relating to the ocean environment. In 2005, MMS also completed a multi-disciplinary literature review of 900 citations of research by numerous scientists specific to the Chukchi Sea. The bureau also held a Chukchi Sea Science Update meeting that included over 20 presentations on Chukchi Sea oceanography, chemistry, marine mammals, fish, marine and coastal birds, and subsistence and cultural resources. Scientists from the University of Alaska, FWS, National Aeronautics and Space Administration (NASA), the United States Geological Survey (USGS), the North Slope Borough, and other Federal and State agencies participated in this Update.

This activity continued in 2006, when MMS sponsored a meeting attended by over 100 scientists and stakeholders geared to develop a long-term research plan for the Chukchi Sea. As a result, a suite of research was developed to study marine mammals, sediments, birds, fish, subsistence, and communities, with new studies starting in 2007 and 2008. This research will help monitor effects from any future exploration or development activities. In addition, MMS has actively partnered with several other Federal agencies in recent years through the National Oceanographic Partnership Program to sponsor highly relevant arctic research on numerous marine mammal and ocean circulation topics which will contribute to our understanding of the Chukchi Sea environment.

MMS's Continuing Role After The Lease Sale

MMS's job, however, does not stop with the lease sale. In fact, in some very important ways it is just beginning. In accordance with the OCS Lands Act, before any drilling begins, a company must provide a detailed exploration plan explaining how its operations will be safely conducted and how any potential environmental issues will be mitigated. In particular, MMS regulations require specific information detailing the mitigation and monitoring programs for protected species, which include all marine mammals and species listed as threatened or endangered under the ESA.

Companies also must obtain permits from other agencies, such as the Environmental Protection Agency (EPA), and ensure their plans are consistent with the Alaska Coastal Zone Management Program. MMS then completes a technical and environmental review of the plan, provides copies of the plan to FWS and NMFS for review, and consults with FWS and NMFS under the ESA, as necessary. If a company pursues a discovery to production, MMS again undertakes a thorough technical and environmental review of the proposed activities, including ESA Section 7 review with FWS and NMFS, as necessary.

There are many types of marine mammals living in Alaskan waters, and the industry and Federal and State government agencies have a long history of operating safely in inhabited areas. All of the 30 exploration wells drilled in the Beaufort Sea have been drilled safely on the OCS and a few hundred exploration and production wells have been drilled in State waters and onshore along the coast.

The MMS also has a robust regulatory system designed to prevent accidents and oil spills from occurring. This includes redundant well control equipment, emergency plans for ice conditions, production safety systems, and much more. In Alaska, an MMS inspector is onboard drilling rigs 24 hours a day, 7 days a week during critical drilling operations. For the nearly 90 wells drilled offshore Alaska since 1975, there have been no crude oil spills and only minimal amounts of oil products used in the development and production operations. However, because spills are always a possibility, we carry out an analysis of the potential in our reviews and require oil spill contingency plans.

Substantial clean-up technology exists for the Arctic region. Before MMS will approve operations in Alaska, we require the development and demonstration of a wide range of response tactics, including mechanical and non-mechanical measures that work in sea ice and subfreezing temperatures found in the Arctic. An operator must demonstrate sufficient personnel to mount a 24 hour per day response, with protections for sensitive sites and animals in the area. For example, MMS requires that clean up plans address areas where polar bears may congregate.

The MMS is a major sponsor of projects directly related to improving Arctic oil spill response. In October 2007, MMS cosponsored the International Oil in Ice workshop. Over 270 participants from 7 nations gathered to discuss available and future technologies to detect, contain, and clean up oil spills in the Arctic region. Over the past six years, MMS has funded and successfully conducted 48 research and development projects directly related to improving Arctic oil spill response and to providing regulators with related scientific data. Ongoing research includes response technologies for remote sensing and surveillance, mechanical response, and in-situ burning. While more work remains to be done, this research has contributed to the development of effective ways to deal with spilled oil in Arctic conditions.

As noted above, if the polar bear is listed as threatened, MMS will, along with all Federal agencies, comply with section 7 of the ESA. In the interim, MMS will continue to work closely with the FWS to review and identify the specific oil and gas activities that could affect polar bears and identify mitigation and monitoring measures that seek to reduce the potential for impacts to occur.

Conclusion

Over the past 30 years, with existing regulatory programs in place, oil and gas activity has operated safely and compatibly with the marine life in the Alaska OCS, including polar bears. Existing laws provide the flexibility to ensure the proper level of mitigation if conditions change. The MMS has been, and remains, committed to ensuring that offshore oil and gas activities not only provide needed energy for our nation, but are also carried out in a way that ensures the continued protection of our environment for future generations. We believe these two goals are compatible.

Mr. Chairman, this concludes my remarks. I would be happy to answer any questions you may have.

The CHAIRMAN. We also have with us and sitting at the table Dr. Steven Amstrup, who is the Polar Bear Team Leader for the United States Geological Survey. He is not going to deliver an opening statement, but he will be here to answer questions from any member of the select committee. He is a renowned wildlife biologist with the USGS at the Alaska Science Center and one of the world's preeminent polar bear experts.

So we thank you for being here as well, Dr. Amstrup.

So the Chair will now recognize himself for a round of questions. Let me begin with you, Director Hall.

Can you assure the committee and the public that science and only science is and will control the final listing decision for our polar bear?

Mr. HALL. Yes, sir.

The CHAIRMAN. Director Hall and Director Luthi, will the final polar bear listing decision be made and be effective before the scheduled February 6th Chukchi lease sale?

Mr. HALL. Since that time frame is in my lap, I will respond to it.

Mr. LUTHI. Thank you.

Mr. HALL. Last week I held a press conference and announced that we will have to take some extra time. That responsibility is mine. I don't like to do that. I don't like to miss due dates, but I want to make sure that when we roll out a package to the public in the Federal Register, that it clearly demonstrates the well-thought-out process that we went through and how and why we reached the conclusion that we reached.

It was mentioned earlier that there are uncertainties in science, and frankly, that is the nature of science. If we moved forward expecting to have a decision that didn't have uncertainties with it, we would never make a decision. That is the world we live in. And natural resource management, we are constantly predicting what might happen in the future, but not just what might; what do we expect, what do the best data lead us to believe. And taking this extra time, I wanted to make sure that our staff and I had enough time to clearly understand, be able to explain both the reasons why we accepted the information that we accepted and relied upon and the reasons why we didn't.

The CHAIRMAN. I appreciate that, Director Hall, but we do need assurances that the public listing decision will be made before the lease sale. And so there is a real problem here, and we have to do something about it. So I am going to introduce legislation later today with members of this committee that will ensure that the Interior Department makes these two decisions in the correct order.

My legislation will require that the final listing and critical habitat designation decisions for the polar bear be made before the Chukchi lease sale can take place. This will not prevent the Chukchi Sea leasing, but simply require that the Interior Department, the two of you sitting here, make the decisions in the proper order to protect the polar bear. It is one agency; you have one Secretary who runs your agency, and this decision-making process should occur in the proper sequence. And I am going to introduce legislation to make sure that that is the way in which it happens.

Dr. Amstrup, can you tell us in your opinion how endangered is the polar bear?

Mr. AMSTRUP. Thank you, Mr. Chairman.

Our research completed this past summer contributed to a body of information that already existed on polar bears. That research suggested that within the next 50 years or so, that the population of polar bears could decline by approximately two-thirds because of changes in the sea ice habitat that are related to global warming. These results were based on a variety of modeling efforts, based on outputs from general circulation models, and outputs from population dynamic models, and our best attempt to synthesize all of those into a comprehensive forecast of what the future for polar bears might be.

The CHAIRMAN. I thank you, Dr. Amstrup, very much. I thank you for your work as well.

This is an important moment for Secretary Kempthorne. He must do the right thing. He must ensure that Mr. Hall makes his decision before Mr. Luthi makes his decision. He must make sure that the polar bear has the proper legal protection before Mr. Luthi makes his decision as to where and how drilling will take place for oil and natural gas.

We don't want to either lose a polar bear or our potential for more oil and gas in this country, but we have to do both in a way that is sensitive to the role that each plays in our society, and Secretary Kempthorne has a big historical moment that he is going to be presented with. And we are going to do everything that we can in order to ensure that the public understands how critical that decision is.

Let me turn now and recognize the gentleman from the State of Wisconsin Mr. Sensenbrenner.

Mr. SENSENBRENNER. Thank you very much, Mr. Chairman.

I have a technical question for Dr. Amstrup. What has been the trend in the polar bear population since 1972? Do we have more of them, less of them, same number?

Mr. AMSTRUP. Thank you, Congressman. That is a good question because it is one that has come up repeatedly in the press and in the public.

Historically our knowledge about polar bears goes back to about the mid-1960s, and it was at that time that people who were interested in Arctic wildlife realized that polar bears pretty much worldwide were being harvested extensively. We had aerial trophy hunting that was occurring in Alaska. There was ship-borne trophy hunting that was occurring north of Norway. They were using set guns on the Svalbard archipelago to kill polar bears, basically a trap kind of a situation, to get the furs, and populations were recognized as being very low at that time frame. Just how low they were wasn't clear because nobody had been doing——

Mr. SENSENBRENNER. My time is limited.

When did the hunting protection of polar bears kick in? What year was that?

Mr. AMSTRUP. 1972 is when the Marine Mammal Protection Act kicked in.

Mr. SENSENBRENNER. So the Marine Mammal Protection Act, at least in the United States, stopped the type of hunting that you were describing that occurred in the 1960s.

Now, what has happened to the polar bear population since the Marine Mammal Protection Act became effective; has it gone up?

Mr. AMSTRUP. Our research has shown that the populations have increased substantially not only in Alaska, but in many other parts of their range.

Mr. SENSENBRENNER. That is the answer that I was looking for.

Now, Mr. Luthi, did I hear you correctly when you testified that the proposed lease in the Chukchi Sea, there had been an examination of the impact on the polar bear habitat, and the result was that if the exploration and the drilling occurred, that there would be a negligible impact on the polar bear added to it? Did I hear you correctly when you said that?

Mr. LUTHI. That is correct, and that was also, I believe, a statement by Director Hall.

Under the Marine Mammal Protection Act, we are also required to confer with the wildlife agencies, and that is actually one of the stricter acts that is available, and we must comply with that as well.

Mr. SENSENBRENNER. Well, after hearing you, Dr. Amstrup, and having heard the result of your study, Mr. Luthi, let me say that the fears that I expressed in my opening statement I guess are coming to fruition. It seems that the scientific evidence that Dr. Amstrup has referred to and the study that Mr. Luthi has done in the course of the discharge of his duties indicates that while there is perhaps a problem with polar bear population, going ahead with the lease will not have a major impact on the habitat of the polar bears in this part of the sea across Alaska.

Now, if that is the case, then I don't think Mr. Markey's bill has the scientific background that is necessary to effect what he wants to do, and that this process is going along fairly well, even though it is a two-track process under the existing law that has been passed by this Congress. So what is the beef? And I yield back the balance of my time.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Thank you.

I just want to comment on some of the things said on opening statement about the problem that we face, people suggesting that there is no clear science about what is happening in the Arctic. And it is unbelievable to me that people are still adopting the attitude of the ostrich in this situation.

One million square miles of the Arctic disappeared this summer, that is the size of six Californias disappeared, stunning the scientific community; the news that probably about 40 percent of the depth of the Arctic has gone AWOL in the last couple of decades. And people who refuse to ignore this plain visual evidence—I don't know how we are going to solve our problems as a country if they refuse to recognize the visual evidence. It is not hypothetical, it is not theoretical, it is gone. I just want to make that comment.

I want to ask Mr. Luthi about the risk of oil spills with polar bears. Some people suggested essentially no risk, but I am reading from the Environmental Impact Statement of May 2007. It says, we estimate the chance of a large spill greater than or equal to 1,000 BBL occurring in offshore waters is within a range of 33 to 51 percent. For purposes of analysis we model one large spill of either 1,500 BBL platform spill or 4,600 BBL pipeline spill. If a large spill were to occur, the analysis identifies potentially significant impacts to bowhead whales, polar bears, essential fish habitat, marine and coastal birds, subsistence hunting, and archeological sites. Is that the conclusion in the Environmental Impact Statement?

Mr. LUTHI. Thank you, Mr. Chairman and Representative Inslee. I believe you may be reading from our Environmental Impact Statement; is that correct?

Mr. INSLEE. Yes.

Mr. LUTHI. An Environmental Impact Statement, as you are well aware, has asked us to basically evaluate all kinds of impacts. I don't think we would be doing our job effectively if we didn't realize and say that we are going to look at the possibility of a spill whenever there is development. The history shows us differently. The reality is particularly in the Alaska area industry has been very careful, and we require that they be responsible for also having cleanup equipment available.

But we do want to say that there is the potential to spill, otherwise it would be——

Mr. INSLEE. I appreciate that, and that is why we would like to have the science before you make the decision. If I told you there is a 33 to 51 percent chance of you getting run over by a bus in the next year, I think you would think that was significant, and you would want to know that before you made decisions.

You have concluded there is a 33 to 51 percent chance of a spill, which, in your own words, and I will quote from your own agency Final Environmental Impact Statement, says, "Our overall finding is that due to the magnitude of potential mortality as a result of a large oil spill, the proposed action would likely result in significant impacts to polar bears if a large spill occurred," close quote.

Despite that own finding of your own agency, nonetheless you have decided, unless something changes, to go ahead with the lease of these extreme number of acres, despite the fact that that is a substantial risk, knowing that the other part of the agency is about to enter or could enter an endangered or threatened species declaration; is that accurate?

Mr. LUTHI. Mr. Chairman and Representative Inslee, you quoted the EIS certainly accurately, and I would point out to you the word "if a large spill occurs." The purpose of an impact statement is to evaluate those potentials. We then are left to the agency some discretion of how to overcome and mitigate that potential impact which we have.

Now, in addition, you mentioned the second part of your statement deals with before the Endangered Species Act kicks in or if it does. Frankly, as I said in my opening statement, we have worked with Fish and Wildlife Service very carefully about consultation not only with the polar bear, but also all marine mammals. We believe that adequate protections exist. Should the Fish and Wildlife Service list——

Mr. INSLEE. I understand you believe that, but I tell you what, my constituents do not believe that. My constituents believe, the 650,000 people believe, that you are acting in willful ignorance of known science by making this decision before the taxpayer money is used adequately to evaluate this science. And when your own agency recognizes this threat, it is, I believe, negligent in the extreme to make this decision without having the declaration by the other agency.

One other question. I sense from your testimony, reading your testimony and what the agency has said, that it treats a declaration of endangered or threatened species as sort of a nullity, kind of no big deal. We kind of do the same thing whether or not there is a designation, and I find that totally disrespectful of the law, and I can't understand how you take that position. Tell us what would be different about your leasing decision if there had been a designation before your decision?

Mr. LUTHI. If I understood your question correctly, it would be what would change if the polar bear had been listed as we went through the sale process; is that correct?

Mr. INSLEE. Yes.

Mr. LUTHI. What would be different would be one more layer of consultation, and it would be an official consultation under the Endangered Species Act. However, and let me underline "however," what I believe you are not pointing out particularly is the protections under the current act, the Marine Mammal Protection Act, which in many senses is actually more strict. What the consultation would result in—well, we don't know what it would result in, but what the purpose would be is to make sure any activities that we authorize do not jeopardize the existence of whatever creature or critter happens to be listed.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentleman from Oregon.

Mr. WALDEN. Thank you, Mr. Chairman. I want to continue to pursue this line of questioning.

Mr. Luthi, I had written down this question: What happens if you go ahead with the leases, and then the polar bears are listed? Tell me practically what happens.

Mr. LUTHI. Mr. Chairman, Representative Walden, thank you for that question.

Should the polar bear be listed, what that does is add an additional layer of consultation. The leasing process is actually a very phased process. The sale of the lease is only the first. The second step comes in when the company develops an exploration plan. That plan has to be approved by us. It has to be reviewed by the Fish and Wildlife Service agency. It has also to be consistent with basically the State plans as well. So that would be probably the first time that additional layer of consultation would take place is when they actually had a development plan. That would occur again should they have a production plan, and at least one more time in the process before the oil or gas should actually flow.

Mr. WALDEN. Do you have other threatened or endangered species listed where you have leases in the Arctic?

Mr. LUTHI. Yes, we do. We have the—the eiders are listed, as well as, I think, one of the whale species; is that correct, Dale? Yeah, yeah. Actually that would be on the whales we consult with the National Marine Fishery Service.

Mr. WALDEN. Can you tell me the historic activities that have occurred after those leases have been let and the species have been listed? Have you seen spills, have you seen threats to these species, have you seen loss of life?

Mr. LUTHI. Mr. Chairman, Representative Walden, I am pleased to tell you that in the limited exploration and development that has happened in the current Outer Continental Shelf of Alaska, we have seen no blow-outs, only very small spills, and these are spills that are normally contained. They are more diesel in the preparation as opposed to actual crude oil, and we have not had—to my knowledge, there has not been a take or harassment of the endangered species.

Mr. WALDEN. Now, talk to me a bit about—you mentioned in response to Mr. Inslee's question, but you didn't get into any detail, that you would have to overcome and mitigate if there were a spill. I mean, your environmental planning process says, here's the range of options, here's the worst thing that could happen, and then don't you go to the next step and say, and here's how we would mitigate to make sure that didn't happen? So I am concerned Mr. Inslee is saying you have a 33 to 50 percent chance of is it a 1,000-barrel spill?

Mr. LUTHI. I believe that is what he quoted.

Mr. WALDEN. And is that your worst-case scenario?

Mr. LUTHI. Mr. Chairman, Mr. Walden, I believe it is. But what I would also like to do, Mr. Chairman, if you would grant me the opportunity, I brought back-up. John Goll is our Regional Director in Alaska and has worked personally on the EIS far longer than I have. And if you would want more technical answers——

Mr. WALDEN. Yes, I would. Mr. Chairman, if that is okay.

The CHAIRMAN. I have no problem. The gentleman has a minute.

Mr. WALDEN. I have about 2 minutes left, so make it quick.

The CHAIRMAN. If the gentleman would come up to the table, identify himself for the record and then answer the question from the gentleman. And I will extend the gentleman an extra minute.

Mr. WALDEN. Thank you, Mr. Chairman. I appreciate it.

Mr. GOLL. My name is John Goll. I am the Regional Director with the Minerals Management Services Office in Anchorage, Alaska. And with regard to, we review basically two types of information when we evaluate a sale. One is what we reasonably expect. That is activity that we know will happen, the activity in the water and such. And, for example, when an operator goes under there in Alaska, they have gotten authorization from either the National Marine Fisheries Service or the Fish and Wildlife Service for the Marine Mammal Protection Act authorization. So that is where the protection comes in. The companies do apply for that. And they are required then under those acts to follow certain requirements.

We also evaluate though, again for disclosure, that if there were a spill what might happen. So we look at the various kinds of scenarios, and that I think is what you are asking.

Mr. WALDEN. Then I also understood you have then mitigation to overcome that, is that right, proposals to overcome and then what you would do if it happened?

Mr. GOLL. Actually, the expectation from a sale from an expected value is that we expect no significant spills.

Mr. WALDEN. I am going to run out of time here. I want to go back to this issue that there is an anticipation of a 33 to 51 percent likelihood of a 1,000-barrel spill if these leases are let. Is that accurate?

Mr. GOLL. That is what our statistics show.

Mr. WALDEN. And you have no way to mitigate or prevent that?

Mr. GOLL. No, there is mitigation.

Mr. WALDEN. Okay. Get to that.

Mr. GOLL. The last offshore spill from a platform was in 1980. Spills generally occur, if they do occur, at the development stage, and we have had a very good record since. There are many redundancies with regard to the drilling programs. The technology today is much better. The statistics we have used go back in time, so you are including a lot of past records.

Mr. WALDEN. So in the 33 to 51 percent chance of a spill of 1,000 barrels this does not reflect modern technologies?

Mr. GOLL. Our goal is to prevent any spill from occurring. And with our regulatory system what I am saying is we have been very successful in that in the last 2 decades or so.

Mr. WALDEN. Since 1980. Almost 3 decades then?

Mr. GOLL. Correct.

Mr. WALDEN. Thank you, Mr. Chairman. Thank you for the courtesy in extending the additional time. I appreciate the witness' comments.

The CHAIRMAN. The gentleman's time has expired. The Chair recognizes the gentleman from Connecticut, Mr. Larson.

Mr. LARSON. Thank you, Mr. Chairman. And let me continue with this line of questioning, because I think it is informative. Mr. Markey has made a proposal that seems to me just on the face of it to be logical and pragmatic. Mr. Hall, Mr. Luthi, would you object to the legislation as proposed or do you think that that is sound policy and practice?

Mr. HALL. Well, it is probably a question that I can't answer, because I don't make the decision for the administration on what they support or don't support. That comes through the statement of administration first.

Mr. LARSON. Well, let me ask you personally.

Mr. HALL. Personally, the activities, what Director Luthi has been saying is true. We don't have any substantial records that the oil and gas exploration have created an issue for the polar bear.

Mr. LARSON. And yet Mr. Inslee in his questioning says that by your own statement you recognize that should a catastrophe occur there is a risk here of 33 to 51 percent, which you both said earlier this would have negligible impact. Does it not make sense to follow what Mr. Markey has laid out so that we can, or is it because you don't want to encounter the consultation that you will have to go through that surrounds making the polar bear an endangered species? What is the big deal here? I don't understand why—what is behind this? Why wouldn't you proceed in the order that Mr. Markey has suggested?

Mr. HALL. We will proceed. And quite frankly if I hadn't made the decision that I made to give us more time it would have worked that way anyway. And I apologize for doing that, but I just felt like we had to give our staff an opportunity. But quite frankly I am a biologist that happens to be sitting in a position that is political and has that ramification, and I am never quite comfortable in telling anybody what kind of laws they should pass.

Mr. LARSON. Well, listen, I thank the both of you for your public service. These are difficult decisions, but they are very important decisions for the country, and in this case for not only the polar bear, but as you have acknowledged in your own comments, other mammal life as well.

Dr. Amstrup, could you answer the question, given the record low summer sea ice this year, what are you doing to understand the impact on polar bears and what could you tell us about the future impact of global warming and this melting with regard to that?

Mr. AMSTRUP. Well, let me try and answer the second question first. The work that we have done has suggested that the changes in the sea ice that are projected to occur and have already been observed to have occurred are having a negative impact on polar bears across different reaches of their range. And we expect that those negative impacts will continue. What we are planning to do about them is, in terms of understanding what our projections, how accurate our projections are and whether or not we need to adjust our projections in the future, is we do plan to continue the monitoring that we have been doing for years. We are trying to get work done in the Chukchi Sea, which we don't have much recent research ongoing or haven't had recent research ongoing in the Chukchi Sea. We do plan to continue the research in the Beaufort Sea where we have got a long-term data set. And we are hopeful that that will continue to refine our understanding of the impacts.

Mr. LARSON. What would a spill, as they have indicated in their own assessment here, what would that mean with respect to the polar bear?

Mr. AMSTRUP. We don't really have any data that would address what the effects of a spill of that size might be in that environment. We did do an analysis of an oil spill in the Beaufort Sea on an offshore proposal that was made some years ago. And what our research showed there is that spills that escape the shoreline, that is when the oil moved offshore, there was a substantial risk of a large number of bears encountering the oil. In the Chukchi Sea the situation is very different than it was in the Beaufort Sea, and it would require additional work like that to get quantitative information on what those risks might be. With regard to the risks of polar bears if they encounter oil, the data that are available are few, but pretty clear polar bears do not do well when they get into oil. They tend to groom themselves, they ingest the oil and the spills tend to have a—basically they most likely are fatal.

Mr. LARSON. Now, Mr. Luthi, would you in the question I asked Mr. Hall before, just as a quick follow-up, do you think that Mr.

Markey's proposal is a common sense, pragmatic course that we should take? What is the big deal here?

Mr. LUTHI. Mr. Chairman, Representative Larson, I appreciate the question. Again, I haven't seen the proposal. I would have to read it in detail. However, as I would say again, we wouldn't be proceeding with this sale if we weren't comfortable that we had enough knowledge, enough data, to say that we can adequately see that the polar bear is protected, as well as other endangered species, if, let me underline if, if the department makes a decision to list the polar bear. We take it—I am very serious about seeing that we do this right. And I believe we are doing it right.

It is interesting. We talk a lot about data and science and the information that is out there. And one of the reasons the data that has been collected so far is in anticipation of sales. That is one of the reasons that we actually start spending money to try and get more and more data about the Chukchi Sea, about natural resources. So it is actually a help, and to some degree with our scientific knowledge.

The CHAIRMAN. The gentleman's time has expired. The Chair recognizes the gentleman from Arizona.

Mr. SHADEGG. Thank you, Mr. Chairman. I apologize for my late arrival. I am fighting a bad cold.

Mr. Hall, can you give me a broad description of the implications of trying to make a decision to list a species as endangered or threatened in the context of global warming?

Mr. HALL. Well, this has been one of the most difficult processes that we have gone through because it is atypical. Normally the 1,300 species that we have on the list, we have seen wetlands developed, we know exactly the point sources of where we are losing them, all the different aspects associated with it. We have better population estimates in a lot of cases. So in the case of global warming where the impacts are coming literally from everywhere, it has been pretty difficult. However, the responsibility to answer the questions brings it back into scope that we can deal with. Because the questions under the Endangered Species Act still deal with the habitat for the species, the impacts that may occur to the species, and those we call the five factor analysis. And that is the process then that we have gone through with the help of USGS and any other science that is out there to understand, not necessarily all the different sources and where they are coming from, maybe even what country they are coming from, but for the purposes of the listing of the Endangered Species Act, it is what is happening to the habitat that is the question that we are answering.

Mr. SHADEGG. Would any of the other of you like to comment on that?

Mr. LUTHI. I don't think I can add anything to the procedural aspects. If there is a particular question I would attempt to try it involved with the Chukchi Sea or the sale process.

Mr. SHADEGG. Mr. Hall, is there the potential that someone could, on the basis that the sea was rising, allege that some country was, an island country, could allege that the species on their habitat were threatened as a result of what is happening and try to affect any decision you make based on a remote effect, and you said depending on the country it is coming from effects very remote from where, for example, you were looking up?

Mr. HALL. I am sorry. I am not exactly sure what you are asking.

Mr. SHADEGG. Let us say a company in my State of Arizona decided it wanted to build a coal-fired power plant. Would they be required to consult with the Fish and Wildlife Service to ensure that their actions wouldn't affect polar bears in the Chukchi Sea?

Mr. HALL. They would be—anyone that is proposing an activity that could impact a listed species, if it has any kind of Federal connection, would require Section 7 consultation, and under coal-fired plant. Then Energy or whomever would have to consult. The question would then be, do we have the science, do we have the technology, do we have the capability of making the linkage to take. Because the Endangered Species Act is pretty specific in what we have to establish. And the courts have made sure that we understood that.

Unfortunately, we have lost some cases where the courts felt like we were being speculative in coming up with take. The Arizona Cattle Growers Association case at the Ninth Circuit upheld, told us that we were wrong, that we couldn't speculate, that we had to have a direct cause leading to take before we could say that take was occurring. And that the attorneys that have really interpreted that to mean the but-for clause: But for this action would this take have occurred. And the burden is on us and the science to be able to make that very direct linkage to the take and to the diminishment of the population of the species. Because the Endangered Species Act listing is for the species. Habitat is a measurement of damage or positive impacts, if we can improve it, to the species. But the act has us analyze take and then leading to jeopardy or no jeopardy. And the science as it is today, even the IPCC information, would not allow us to segment out that this particular set of emissions caused this particular set of impacts leading to take. That is the difficulty with this.

Mr. SHADEGG. I think the answer to my question is, and my time is up, if the allegation was that those emissions could cause that effect, if they could answer the but-for, the answer to my question would be yes?

Mr. HALL. Yes. They would have to consult if they believed that they may contribute to the effects. But then the next question is, is it likely to adversely affect. And that is really the part I was answering there that would be extremely difficult to deal with.

Mr. SHADEGG. Fair enough. Thank you very much.

The CHAIRMAN. The gentleman's time has expired. The Chair recognizes the gentleman from Missouri, Mr. Cleaver.

Mr. CLEAVER. Thank you, Mr. Chairman. Mr. Hall—Mr. Luthi first. Are you familiar with the USS *Arizona*?

Mr. HALL. To some degree yes, sir.

Mr. CLEAVER. It went down in Pearl Harbor. It was one of I think nine ships that went down in the attack. Have you ever gone there in Pearl Harbor to see the ship which is on the bottom, but there is an area where people can walk over and actually look down in the water and see the remains?

Mr. LUTHI. Unfortunately, I have not been able to see that personally, Congressman Cleaver.

Mr. CLEAVER. Each day when thousands of people go over, actually it is the number one tourist attraction in Hawaii oddly, oil is bubbling up out of the Arizona every single day 60 years later, 60 years later. You can see it on the water. I mean it is just laying on the water and you can see it bubbling. It is amazing that it is continuing this long. And so I watched it last week and realized the lasting impact on oil spills and what it does to the environment and to the animals and species that are impacted.

I am also wondering, this is a difficult question, I hope it is fair, do you think that the U.S. Fish and Wildlife Service is strictly dealing with fish and wildlife or does it get into ideological issues as it looks at fish and wildlife issues? Any of you.

Mr. LUTHI. Mr. Chairman, Congressman Cleaver, this is one I think I really should defer to Mr. Hall as Director of the Fish and Wildlife Service.

Mr. HALL. Well, I am going to try and interpret your question.

Mr. CLEAVER. No, no, no. I will say it again if you didn't understand it. I usually don't like for people to interpret what I say.

Mr. HALL. Good. That is why I was going to say what I thought you said.

Mr. CLEAVER. Okay. Good. What part didn't you understand?

Mr. HALL. The philosophical part.

Mr. CLEAVER. No, ideological.

Mr. HALL. Ideological, okay.

Mr. CLEAVER. Is it ideological or scientific, is your decision ideological or scientific or is it a mix of two?

Mr. HALL. Over my 29 years with the Fish and Wildlife Service I think I can speak with some confidence that our employees approach work from, number one, trying to be a professional, and number two, trying to be honest about what we know and don't know. And as I spoke earlier, in all science there is a lot we don't know, but we have to deal with it. But as far as being ideological, I believe the vast majority of our employees, and I am one of those, believes that we should be advocates for truth, whatever that is. And if the truth means that there is an impact, we need to say that and if the truth means there isn't, we need to say that. Because I think the public depends upon us to be as honest in our disclosures as we possibly can be.

Mr. CLEAVER. I appreciate that.

Mr. HALL. If that is the ideology you are talking about.

Mr. CLEAVER. Yes. Not completely. But I mean when we begin to discuss this issue, global warming, endangered species, quite often we get into an ideological discussion that has to do with free commerce and government intervention into business and that kind of thing. And so there is a whole bit of resistance to the acceptance of the science based on ideology and not science. But dealing with the whole issue of receiving the facts and dealing with them honestly, is there any doubt in your mind at this point that the habitat of the polar bear has been damaged?

Mr. HALL. Oh, I think there is a difference between has been. We certainly lost 20 percent. But the decision that we are trying to make, and will make, will be over the foreseeable future, which actually would take us out to mid century as well. And we know, based upon the science, that the habitat is leaving us. So there is no doubt that that is happening.

Mr. CLEAVER. So what is the problem?

Mr. HALL. There is a lot of—you know, I have tried to say this, and perhaps I am not being clear. It is not just making a decision that is important. It is making it clear and why. Because we had over 600,000 comments come in, and there were people that didn't agree that the issue you have described is there. There are people that believe that it was. Our responsibility is to answer for everyone that when we have uncertainty, that we accept, because we accept some risk in everything, but we explain that.

Mr. CLEAVER. But you——

Mr. HALL. I want to get to when I release a document with my signature——

Mr. CLEAVER. Excuse me, my time is running out. But you have already said that you agree with me that the habitat has been damaged?

Mr. HALL. Uh-huh.

Mr. CLEAVER. Didn't you say that?

Mr. HALL. I think that is factual record that we have lost 20 percent of the ice, I believe it is 20 percent since the 1970s, roughly, a little more than that. I think that is scientific record.

Mr. CLEAVER. So how much do you think we need to lose before we say this is a clear—you said you wanted to make sure that everything was clear—that this is a clear problem, because 20 percent looks clear to me. I mean if I had $100 and lost 20 percent of it, I clearly lost $20.

Mr. HALL. Okay. Maybe I might owe you an apology. I thought you were talking about the listing decision versus a decision that we need to do something about climate change. We need to do something about climate change starting yesterday. And it needs to be a serious effort to try and control greenhouse gases, which is probably the only thing we actually can control. If the Earth is tilting, if other things are happening, we can't control that, but we need to look at those things we can.

Mr. CLEAVER. Thank you.

The CHAIRMAN. The gentleman's time has expired. The Chair recognizes the gentleman from New York, Mr. Hall.

Mr. HALL of New York. Thank you, Mr. Chairman. Dr. Amstrup, when the ranking member asked you a question about bear population, he cut you off when you were still talking. I was curious if you were going to say anything further about recent years of population.

Mr. AMSTRUP. Thank you, Congressman. I was going to add a couple of comments. So the trend from the time that the over exploitation was recognized in the late 1960s and early 1970s was a period of growth in many areas of the polar bear's range. And unfortunately we don't have data from all areas of the polar bear's distribution. But to the extent that we have data, it suggested a period of population growth. But that was in a period of stable environment, stable sea ice. And it has changed in recent years. We have seen the loss of ice that Congressman Cleaver was just referring to. And it is projected to continue to decline at a rapid rate. And in fact the declines that are predicted actually haven't been as fast as what we have actually observed. So it is clear that we are losing an increasing amount of polar bear habitat. The habitat losses in a couple of areas have already been shown to have negative effects on polar bear populations.

Mr. HALL of New York. Can we quantify this or do we just know that as we lose habitat therefore we must be losing population?

Mr. AMSTRUP. It has been quantified in Hudson Bay, in the Western Hudson Bay population, we have seen significant declines in survival and a 22 percent loss in population size.

Mr. HALL of New York. I am sorry. I only have 5 minutes. I want to get to a couple other things. Thank you for filling in some more of your answer. I wanted to ask Mr. Luthi and Mr. Hall, I guess Mr. Luthi first, your charts and slides about consumption projecting this 24 percent demand increase by 2030, in my district we have held, I have held, my office has held hearings around the 19th District of New York on solar energy, on biofuels, on efficient—high efficiency building techniques and on hydrokinetic tidal power, which is being tested in the East River. And my constituents are coming out in overflow crowds to find out what they can do, to ask what they can do. And a lot of them are doing something, as I am, buying wind power every month in my home, burning 20 percent biodiesel in my home, heating oil, driving a hybrid vehicle, et cetera. And we just passed a substantial, it is not a perfect energy bill, but it does some things. It puts billions of new dollars into renewables and into conservation and carbon sequestration. And we are trying to lead, as I think the United States should try to lead, instead of following, the world in developing these new technologies. And there are regional cap-and-trade systems being set up in the Northeast and the Western States, as well as the European Union and other parts of the world.

My question is whether your projection of the increase and your statement that no matter what we do, I think this is a quote, if I remember it, we will primarily rely upon coal, oil and natural gas in this projected time. Are you saying that, taking into account all these efforts that are being made on renewables and conservation?

Mr. LUTHI. Mr. Chairman, Congressman Hall, that slide comes from the Energy Information Agency, and that is what they are saying, that even with the increased emphasis on renewables, which I support absolutely. One of the reasons I am so thrilled to be Director of MMS is that we are starting an alternative energy program in offshore. But that is what that slide says. That is what they tell us, that no matter what we do it is not going to move fast enough to make a significant decrease through at least the next generation of coal, oil and gas.

Mr. HALL of New York. Excuse me, I want to get through a couple more questions before it goes red. You are aware, I am sure, that California's electricity demand has been flat the last 20 years. It has gone up and down a little bit. It basically has been flat, even as the rest of the country has been on an increasing curve. And that is because we presume the regulatory climate in California being stricter, Air Resources Board and other regulations, that they have adapted to. And California is not a developing nation with no high technology. They have big screen TVs and video games and lots of industry. And so it seems to me that there are examples that we can look at to show that energy consumption can be limited without limiting our way of life and our productivity.

So I don't understand—here is where you get into the question I think that Congressman Cleaver was mentioning about ideology. You can draw a graph that projects—I have seen graphs that project different outcomes depending on what policies this government adopts and what lifestyle. You know, do we choose to fight literally and give billions of our dollars and the lives of our men and women in uniform to take oil from unstable parts of the world or from dangerous and difficult areas like the Arctic and the Chukchi Sea, or do we look for these alternatives that are not as dangerous, but do require us to develop new technologies?

Let me just ask you as a follow-up, because I know my time did just run out, I am curious, the lease total in your testimony, your written testimony, for the Chukchi Sea leases total $500 million. I am curious what the potential value of the oil and gas underneath those leases is, if you have estimated that?

Mr. LUTHI. Thank you. And I will have Regional Director John Goll deal with that technical question, because I think we do have a value. I know we have a value on the amount.

Mr. GOLL. The issue is until you inventory and we really find out what is there we don't know. Our scenario in the EIS is that it would take at least a field of a billion barrels to be able to produce. If you multiplied 1 billion by $100 oil you are talking $100 billion in today's market.

Mr. HALL of New York. Which everybody expects will go up?

Mr. GOLL. Some people, yes.

Mr. HALL of New York. So you are talking about a potential $100 billion yield?

Mr. GOLL. For one field, correct.

Mr. HALL of New York. For a lease of $500 million?

Mr. GOLL. Well, we don't know what we would be getting from the sale with regard to the bids. We don't know that until the sale happens.

Mr. HALL of New York. Well, some of us believe that these offshore leases and leases on public lands have been given away too cheaply to the oil companies. Is there any possibility that that has happened here?

Mr. LUTHI. Let me answer that one. Thank you. Mr. Chairman, Congressman Hall, the Minerals Management Service takes very seriously its responsibility about getting a fair market value for leases. I would invite you to come to our offices and see how we conduct our sales, particularly in the Gulf of Mexico where we have some more experience as well. After a lease sale is offered we actually go through a process once the bids are in and we evaluate whether that truly is a fair market, and there have been times we have turned those leases back.

Mr. HALL of New York. Thank you, sir. I will take you up, and thank you for the invitation. I yield back.

The CHAIRMAN. The gentleman's time has expired. This is a very, very, very important subject and I think this panel does deserve a second round of questions. And the Chair will recognize himself for that purpose.

Dr. Amstrup, what would the impact of an oil spill be on the polar bear? You are America's leading expert on the polar bear. What is your judgment as to the impact of an oil spill on their habitat?

Mr. AMSTRUP. The impact of an oil spill on polar bears would depend on the size of the spill, the currents, the winds that would distribute the oil after the spill. All of those things would have to be taken into account. And we don't have data on those things. But what we do have data on is that the effect of oil on polar bears is in a wild environment where they don't have access to strong medical veterinary care is likely to be fatal. So——

The CHAIRMAN. So it could be a disaster?

Mr. AMSTRUP. If a number of polar bears were affected, they would probably die. And to the extent that that number is large, it could be a big problem.

The CHAIRMAN. Okay. Thank you, Dr. Amstrup, very much. Mr. Hall, would you mind if Secretary Kempthorne made a decision which postponed the decision on the leasing of the Chukchi leases until you made your decision?

Mr. HALL. It wouldn't impact what I am doing at all. So it would be his decision, and whatever he wants to do is fine with me.

The CHAIRMAN. Mr. Luthi, would you mind if Secretary Kempthorne made the decision that guaranteed that Mr. Hall's decision preceded the decision which you are tasked with making?

Mr. LUTHI. Thank you, Mr. Chairman. Again, as I have stated, I am confident that we have done all we needed to do.

The CHAIRMAN. No, I didn't ask you that question. I asked would you mind, would you object if Secretary Kempthorne decided to allow Mr. Hall to make his decision first before you announced your decision?

Mr. LUTHI. Mr. Chairman, certainly the Secretary is my boss. That would be his decision.

The CHAIRMAN. That would be his decision. And so you would accept that?

Mr. LUTHI. Yes, sir, if he should do so. If new information were available and he should make such a decision.

The CHAIRMAN. Well, there is new information available, and that is that Mr. Hall is not going to be able to make his decision unless something happens, that once again keeps the order in place that had been decided upon, which is that Mr. Hall would decide first on the polar bear and the protections needed for the polar bear. Mr. Hall mentioned earlier that he was somewhat uncomfortable as a biologist trying to make a political decision. But the problem is just the opposite. We have political players confronting a scientific decision and the chief decision maker is the Secretary of the Interior, Mr. Kempthorne, who could turn this upside down decision right side up in a nanosecond if he wanted to. All he has to do is say let us use common sense, let us ensure that we understand that extinction is forever and we must make that decision first before we send the oil and gas industry out into the critical habitat to break up the polar bear ice.

And so while I appreciate the testimony that both of you have presented to us today, in the end, if this is not fixed, it is Mr. Kempthorne who is to blame. I hope he understands the importance of his decision. I fear he does not, because this is now a looming threat that has not been dealt with by the Department of Interior. In the end, man can adapt but the bear cannot. We can act to prevent global warming, but the bear cannot. We can develop alternatives to oil, the bear cannot. When the ice is gone, man cheers about new commercial opportunities for oil and gas drilling, the bear starves and drowns.

I have been hoping for common sense from the Department of Interior and from Secretary Kempthorne, but I have heard that all too common abandonment of common sense here today. We are going to have to redouble our efforts on this committee and in this Congress to head off the extinction of the polar bear. If this decision is delayed in making a determination as to drilling in the Chukchi Sea, we will still be years from the first barrel of oil ever coming from the ocean. But if we get this sequence wrong in terms of the protection of the polar bear, we will be accelerating the day when the polar bear will be extinct, and I do not think that that is something the American people want to see.

So I thank both of you for being here today, and I call upon Secretary Kempthorne to make a decision that once again lets Mr. Hall make his decision before, Mr. Luthi, you make your decision. The ball is now in his court.

Let me now turn and recognize the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. The more I listen to this, the more I understand that this is a case of the left hand not knowing what the right hand is doing before they act that could result in a suicide squeeze play for the polar bear. And this is a big deal. I come from the Seattle area where Dr. Cecelia Bitses, who has predicted the demise of the ice cap, where George Devoshe is, who has been studying the Arctic for 25 years now, and is starting for the first time to see star polar bears wash up on the beaches where he has been studying for 25 years, where he has seen very significant changes in migratory bird habits. So it is a big deal in the country I come from. And I want to focus on the fact that this left hand not knowing what the right hand is doing is very important. It is clear, isn't it, Mr. Luthi, that if you do this leasing and then there is a designation of a status by the agency, it will be too late for you to do what the agency may want you to do, isn't that right?

Mr. LUTHI. Mr. Chairman, Representative Inslee, taking some liberty with what you mean, should we go ahead with the leasing sale and offer the leases for sale and some are purchased, then the decision is made by the Department on the status of the bear, we have lost something is what I believe you are indicating, correct?

Mr. INSLEE. You have lost the ability to do what the Federal Government is charged by the taxpayers to do, which is to protect the polar bear. Now, if they make the designation before this they might compel you to reduce the sale by 10 percent, for instance, and you could reduce the sale by 10 percent geographically. But after you issue these leases and then there is a designation and then the agency says, wait, we have got to reduce this by 10 percent to have an acceptable risk to the bear, then isn't it true that it is too late for you to go back and terminate the leases?

Mr. LUTHI. Mr. Chairman, Congressman Inslee, I disagree, one, with the left hand doesn't know what the right hand is doing.

Mr. INSLEE. Excuse me. I want you to answer my question. You may not like my metaphors, but I want an answer to my question. If they designate the bear and you have already issued the leases, you cannot terminate the leases legally, can you?

Mr. LUTHI. We cannot terminate the leases.

Mr. INSLEE. Thank you.

Mr. LUTHI. But we are able to consult on the next stage, which is the actual leasing and sale.

Mr. INSLEE. I want to make it absolutely clear so that you understand. If you go forward on the course you are at and you issue these leases and then the Federal agency that is vested with the legal authority to protect the bear says that those leases will endanger the bear at an unacceptable level to the taxpayer, you will have lost the ability to stop that activity, isn't that correct? Yes or no. I think that is a yes or no answer.

Mr. LUTHI. I will not answer yes or no because it is an incomplete answer.

Mr. INSLEE. Well, you have certainly lost the ability to prevent drilling in certain areas, isn't that correct?

Mr. LUTHI. We have not lost the ability to protect the bear under the Marine Mammal Protection Act at this time.

Mr. INSLEE. I know you don't like the answer to this question, but I think you answered it. Once you issue the leases, it is too late to go back and terminate them, you will not have the ability to take back the leases that the other Federal agency have told you that it would have been unduly dangerous to the bear, isn't that correct?

Mr. LUTHI. Correct. They have the ability to condition those leases, however, to protect the bear under the Endangered Species Act.

Mr. INSLEE. Thank you. I think you have answered my question. Now, the other thing that was a little soft spoken was this 33 to 51 percent chance. I want to make sure I understand this. I am going to read you the paragraph on page E–7—excuse me, ES–4 of your document: Over the life of the hypothetical development and production that could follow from the lease sale, other effects are possible for events, such as a large accidental oil spill or natural gas release. We estimate the chance of a large spill greater than or equal to 1,000 BBL occurring and entering offshore waters is within a range of 33–51 percent. That is a direct quote.

Now, I have heard some suggest, well, no, that is really not, considering all the whiz bang technology we have. But I can't believe that an agency of the Federal Government would issue this document and say there is a 33 to 51 percent chance of a mortal oil spill, not taking into consideration existing technology, not taking into consideration existing geological information, not taking into consideration existing information of the bear. And Mr. Luthi, it is true, isn't it, that your agency reached a conclusion that there is a 33 to 51 percent chance of these type of spills considering existing technology?

Mr. LUTHI. I will ask Mr. Goll to respond. He seems to want to be able to tackle this one. Thank you.

Mr. GOLL. We update the statistics with regard to the probability on a periodic basis, and then that rolls in new technology. So the data there, again, reflected what the past history has been.

Mr. INSLEE. I am sorry, but this should be really, really simple. You used the best information about the technology you have that is available to you when you reached the assessment, isn't that correct? You didn't just ignore what you knew, did you?

Mr. GOLL. We used the best available information at the time, correct.

Mr. INSLEE. Thank you.

The CHAIRMAN. The gentleman's time has expired. Do other members seek recognition for the purpose of asking questions? I don't see any members who do. We thank you all for testifying today. This is the beginning of what I think is going to be one of the most historic environmental decisions in our country's history, and this committee intends on being a part of that process from this moment forward. Thank you.

We have a very distinguished second panel as well. And we will ask each of them to come up to the table.

Ms. Kassie Siegel is the Director of Climate, Air and Energy Program for the Center For Biological Diversity. She is focusing her work on the impacts of heat trapping pollution and protection of plants and animals threatened by global warming. She is one of the leading experts on the polar bear and the Endangered Species Act. We welcome you, Ms. Siegel. Whenever you are ready please begin.

STATEMENTS OF KASSIE SIEGEL, DIRECTOR, CLIMATE, AIR AND ENERGY PROGRAM, CENTER FOR BIOLOGICAL DIVERSITY; JAMIE RAPPAPORT CLARK, EXECUTIVE VICE PRESIDENT, DEFENDERS OF WILDLIFE; AND DEBORAH WILLIAMS, PRESIDENT, ALASKA CONSERVATION SOLUTIONS

STATEMENT OF KASSIE SIEGEL

Ms. SIEGEL. Thank you, Mr. Chairman and members of the committee, for the opportunity to testify, and thank you so much for your leadership on energy independence and global warming. I have some slides which I think will come up in a moment. And as you know, the polar bear is completely dependent on sea ice for all of its essential behaviors, including travel and mating and hunting its primary prey of ice dependent seals. Polar bears can't hunt seals from land. And so tied to the ice are they that some mother polar bears even give birth to their clubs in snow dens like this one we can see, if we can advance the slides.

Advance, please, just to there. Thank you.

The future of the polar bear in a rapidly warming Arctic is grim.

Next slide. Polar bears are drowning.

Next slide. Resorting to cannibalism when they don't have access to their usual food sources and starving.

Next slide, please. This photo was taken in September 2007 in northern Quebec, Canada. This bear is in the final stages of starvation. And while we can't say for sure that this bear died as a direct result of global warming, we know that global warming is and will continue to increase the number of bears that suffer this fate. But we also know that it is not too late to do something about it. And that is why the Center for Biological Diversity submitted the petition to list the polar bear in February 2005. The listing process has already benefited the species by raising awareness of its plight and leading to new information which we would not otherwise have had. Most importantly, the USGS completed a study on the future status of polar bears.

Next slide. To do this they divided the world's polar bear populations into four ecological regions shown here. And they modeled the future population size of polar bears based on the IPCC's A1B scenario, often called the business as usual emissions scenario. The results of the USGS study are profoundly disturbing. Under business as usual emissions polar bears will be completely gone from the divergent ice ecoregion shown here in the purple and the seasonable ice ecoregion shown here in the green by 2050. The good news is that polar bears may hang on a bit longer here in the convergent ice ecoregion in blue, and the archipelago region in orange. But the risk of extinction by the end of the century in these areas is still unacceptably large, over 75 percent in the blue area and over 40 percent in the orange area. Most disturbingly, the USGS study may underestimate the risk to polar bears. This is because the Arctic ice is melting faster than forecast by any of the world's leading climate models.

Next slide, please. You have seen the Arctic ice pack in September 1979.

Next slide. And again in 2007.

This next slide, please, shows graphically actual observed minimum sea ice extent in the heavy red line compared to model projections in the dash colored lines.

Next slide please. Yes, good. You can see that not one single model projected the record new minimum low sea ice extent in 2007 and, further, that there was less ice in the Arctic this past year than more than half of the models projected for 2050.

The situation in the Arctic has reached a critical threshold, but there is still time to save the polar bear if we act immediately. A critically important first step is to list the polar bear under the Endangered Species Act.

Next slide. Our Nation's strongest and most successful law has a critically important role to play in saving this species. And we also need to rapidly reduce our greenhouse gas emissions, including of course carbon dioxide, but also other pollutants, including methane and black carbon that have shorter atmospheric lifetimes for a very high warming impact on the Arctic. And we also need to protect the Arctic in the species most at risk from further direct impacts such as oil and gas activities and the oil spills that come with them. But right now the opposite is happening, and the only thing that is keeping pace with the melting of the sea ice is the breakneck speed with which the Department of Interior is rushing to improve new oil and gas development in polar bear habitat. And now the Fish and Wildlife Service has illegally delayed the polar bear listing as well. It has been over 3 years since we submitted the petition to list the polar bear and we have already had to go to court once. The polar bear shouldn't have to wait any longer.

While there are many reasons the Chukchi lease sale 193 should not proceed, at a minimum this sale and other oil and gas activities in polar bear habitat should not go forward until the polar bear is listed, until its critical habitat is designated, until a recovery plan is in place and then only if these agencies can affirmatively demonstrate that these activities would truly be compatible with polar bear conservation. Chukchi Sale 193 cannot possibly meet this standard and therefore it must be stopped.

Thank you very much.

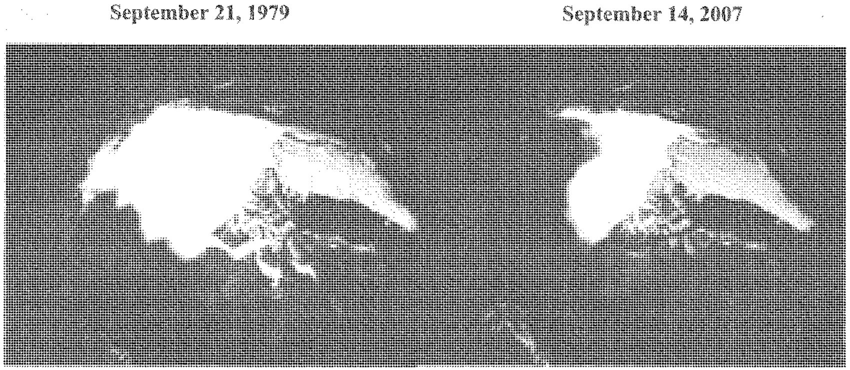
[The prepared statement of Ms. Siegel follows:]

Testimony of Kassie Siegel
Climate, Air, and Energy Program Director
Center for Biological Diversity

To the U.S. House of Representatives Select Committee on Energy Independence and Global Warming

January 17, 2008 Hearing:
On Thin Ice: The Future of the Polar Bear

©Thomas D. Mangelsen/Images of naturestock.com



Courtesy NASA/Goddard Space Flight Center Scientific Visualization Studio

Table of Contents

EXECUTIVE SUMMARY 1

I. The Status of Polar Bears is Tenuous in a Rapidly Warming Arctic 3

A. Observations of Global Warming Impacts to the Polar Bear to Date 3

B. The Future of Polar Bears in a Rapidly Warming World 9

II. The Administration's Unlawful Delay of the Endangered Species Act Listing Process for the Polar Bear fits a Pattern of Political Interference in the Listing Program 12

A. The Administration Has Unlawfully Delayed and Interfered in the Endangered Species Act Listing Process for the Polar Bear 12
  1. Delay and Censorship 12
  2. Failure to Propose Critical Habitat for the Polar Bear 17

B. An Epidemic of Political Meddling in the Endangered Species Act Listing Process 18
  1. The Bush Administration has Essentially Halted Protection of New Species as Threatened or Endangered 18
  2. The Bush Administration has Slashed Critical Habitat Designations and Interfered in Recovery Planning 22

III. The Endangered Species Act Will Provide Substantial Benefits to the Polar Bear 24

IV. A Rapid Action Plan to Protect the Polar Bear 28

A. Reducing Greenhouse Gas Pollutants Rapidly Enough to Address Arctic Melting 28

B. A New Management Paradigm for a Warming Arctic 29
  1. Incorporate Global Warming into Federal Agency Decisions 31
  2. Reduce Other Stressors on Polar Bears and the Arctic 33
  3. Towards an International Protection Regime 35

V. Literature Cited 36

VI. Curriculum Vitae 39

EXECUTIVE SUMMARY

The Endangered Species Act requires all listing decisions to be made solely on the basis of the "best available science." Unfortunately for the polar bear, the "best available science," and in fact *all* available science relating to global warming, sea ice, and polar bears, indicates the species faces global extinction in the wild by century's end and complete extirpation from the United States by mid-century. The polar bear unequivocally meets the criteria for listing as at least "threatened" (and more properly "endangered") under the Endangered Species Act. Nevertheless, the Department of Interior has illegally delayed protection of the polar bear at every turn and is now poised to auction off some of the species' most important habitat in the United States to the highest oil company bidder. This is unacceptable.

Global warming has already severely and adversely affected the polar bear. Since the petition was filed to list the species under the Endangered Species Act in February 2005, new reports detailing polar bear drownings, cannibalism, starvation, and population declines have been published. Impacts predicted for the coming decades have already occurred, with 5 of the 19 populations now considered to be declining. The status of the polar bear has grown more dire, and, with it, the need for protection all the more compelling.

In September 2007, the same month that Arctic sea ice reached a new record minimum extent, government scientists predicted the polar bear would be extinct in Alaska by 2050 if current greenhouse gas emission trends continue. Predictions of polar bear extinction by 2050 may be optimistic. In September 2007, sea ice extent shrank to a record one million square miles below the average summer sea ice extent of the past several decades, reaching levels not predicted to occur until mid-century. Some scientists have recently stated that if the rate of melting observed in 2007 continues, Arctic summer sea ice could be lost in as little as five years.

The accelerated melting of the Arctic requires an accelerated response from the federal government. Instead, the Department of Interior has continued business-as-usual policies of foot-dragging, political interference, and illegal delay in Endangered Species Act decision-making. Protection of the polar bear under the Endangered Species Act is almost a year overdue. Moreover, it has been over 20 months since the Department of Interior has protected *any* species under the statute, and Secretary Kempthorne has failed to protect a *single* species in his 20 months as Secretary. This is the longest listing gap in the history of the Endangered Species Act, and Secretary Kempthorne has, in effect, instituted a policy of non-implementation of this most important of wildlife laws.

In contrast to the Department of Interior's wholesale practice of delaying protection for species under the Endangered Species Act, the Department has shown no such hesitation in authorizing oil and gas development in endangered species habitat. Nowhere is this contrast more apparent than in conflicting positions of the Department with regard to polar bear critical habitat designation and oil leasing in the Beaufort and Chukchi seas. Under the Endangered Species Act, absent rare circumstances where sufficient information is lacking, critical habitat is required to be designated concurrently with listing. In the proposed listing rule for the polar bear, the Department invoked this exception, stating that a "careful assessment of the designation of critical marine areas will require additional time and evaluation" and "there is a degree of uncertainty at this time as to which specific areas in Alaska might be essential to the conservation of the species and thus meet a key aspect of the definition of critical habitat." In other words, the Department will delay critical habitat designation because not enough is known about what areas are essential for the species.

Notwithstanding the fact that the Department purportedly lacks information on what areas in the Chukchi and Beaufort Sea are essential to the polar bear, on June 29, 2007, Secretary Kempthorne approved a five-year oil and gas leasing program that would authorize five separate lease sales in polar bear habitat in the Chukchi and Beaufort seas. Under this program, virtually all offshore habitat for the polar bear in the United States is subject to leasing and development. Lease sale 193 in the Chukchi Sea is the first such sale under this program. It defies logic that the Department could lack sufficient information on the polar bear to protect its critical habitat, yet claims to have sufficient information to authorize the wholesale leasing away of this habitat to the oil industry. While there are many sound reasons the lease sales in the Chukchi Sea must be delayed or cancelled, the failure to identify and protect polar bear critical habitat in and of itself provides more than sufficient grounds to do so.

The situation in the Arctic has reached a critical threshold. The scientific evidence supports a broad moratorium on all fossil fuel extraction activities in the Arctic. Yet the only thing keeping pace with the rapid melting of the sea ice is the breakneck speed with which the Department of Interior, both on land and at sea, is authorizing oil and gas development in the region. The brakes must be put on such activity, while greenhouse gas reduction efforts must be accelerated. By delaying Endangered Species Act listing and offering oil leases in the Chukchi Sea, the Department is doing the very opposite.

The Department of Interior must immediately finalize the listing proposal for the polar bear, promptly initiate and complete the process of designating critical habitat, and convene a recovery team to develop a comprehensive recovery plan for the species. Moreover, the Department must refrain from any further oil and gas leasing, exploration and development in polar bear habitat until the designation of critical habitat and the completion of a recovery plan, and it should only resume such activities if it can affirmatively demonstrate these activities would be compatible with the survival and recovery of the species. The proposed Chukchi Sea lease sale meets none of these criteria and must not proceed.

While the situation facing the polar bear is grim, it is not hopeless. The good news is that the things we have to do to reduce greenhouse gas emissions and protect the polar bear – things like increasing energy efficiency and fuel economy, switching from fossil fuels to renewables and changing our land use and transportation patterns – can all improve our quality of life, benefit our economy, and improve our national security. The barriers to saving the polar bear and solving the climate crisis are political, not technological, and the time for Congressional action is now.

I. The Status of Polar Bears is Tenuous in a Rapidly Warming Arctic

A. Observations of Global Warming Impacts to the Polar Bear to Date

Polar bears are among the most ice-dependent of all Arctic species and require sea-ice habitat for survival (Regehr et al. 2007; Derocher et al. 2004). Polar bears need sea ice as a platform from which to hunt ringed seals and other prey, to make seasonal migrations between the sea ice and their terrestrial denning areas, and for other essential behaviors such as mating (*Id.*) Unfortunately, the sea ice upon which polar bears depend is rapidly melting away.

Global warming is impacting the Arctic earlier and more intensely than any other area of the planet. In parts of Alaska and western Canada, winter temperatures have increased by as much as 3.5° C in the past 30 years (Rozenzweig et al. 2007). Over the next 100 years, under a moderate emissions scenario, annual average temperatures in the Arctic are projected to rise an additional 3-5° C over land and up to 7° C over the oceans (Meehl et al. 2007).

As early as 1972, scientists noted that the polar bear could be adversely impacted by warming via changes in the sea ice and snow cover (Lentfer 1972:169). Canadian researchers were the first to document changes in polar bear parameters such as declining body condition, lowered reproductive rates, and reduced cub survival in the Western Hudson Bay population throughout the late 1980's and early 1990's (Stirling and Derocher 1993). Over the next decade and beyond, these researchers and their colleagues have continued to document the relationships between climate, sea ice, and polar bear physiological and demographic parameters. Stirling et al. (1999) established the link between global warming and reduced polar bear physical and reproductive parameters, including body condition and natality.

A 2004 peer-reviewed analysis by three of the world's foremost experts on the species, *Polar bears in a warming climate* (Derocher et al. 2004:163), concluded that "it is unlikely that polar bears will survive as a species if the sea ice disappears completely as has been predicted by some." Even short of complete disappearance of sea ice, Derocher et al. (2004) predicted a cascade of impacts to polar bears from global warming that will affect virtually every aspect of the species' existence, in most cases leading to reduced body condition and consequently reduced reproduction or survival:

- The timing of ice formation and break-up will determine how long and how efficiently polar bears can hunt seals. A reduction in the hunting season caused by delayed ice formation and earlier break-up will mean reduced fat stores, reduced body condition, and therefore reduced survival and reproduction.

- Reductions in sea ice will in some areas result in increased distances between the ice edge and land. This will make it more difficult for female bears that den on land to reach their preferred denning areas. Bears will face the energetic trade-off of either leaving the sea ice earlier when it is closer to land or traveling further to reach denning areas. In either case, the result is reduced fat stores and likely reduced survival and reproduction.

- Reductions in sea-ice thickness and concentration will likely increase the energetic costs of traveling as moving through fragmented sea ice and open water is more energy intensive than walking across consolidated sea ice.

- Reduced sea-ice extent will likely result in reductions in the availability of ice-dependent prey such as ringed seals, as prey numbers decrease or are concentrated on ice too far from land for polar bears to reach.

- Global warming will likely increase the rates of human/bear interactions, as greater portions of the Arctic become more accessible to people and as polar bears are forced to spend more time on land waiting for ice formation. Increased human/bear interactions will almost certainly lead to increased polar bear mortality.

- The combined effects of these impacts of global warming on individual bears' reproduction and survival are likely to ultimately translate into impacts on polar bear populations. Impacts will be most severe on female reproductive rates and juvenile survival. In time, reduction in these key demographic factors will translate into population declines and extirpations (*Id.*).

Summarizing the various likely impacts of global warming on the polar bear, Derocher et al. (2004:172) come to the following sobering conclusion:

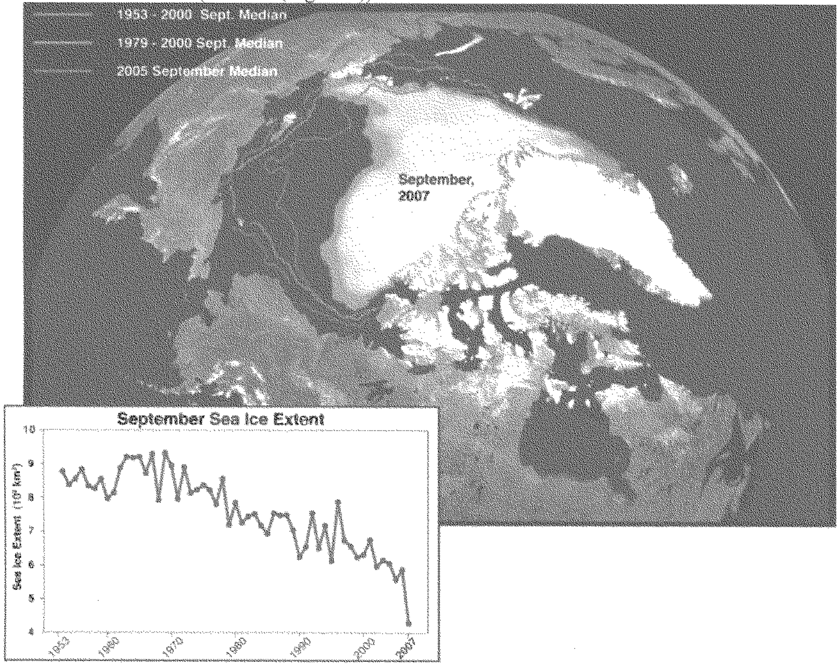
> In contrast to many terrestrial and most marine species that may be able to shift northward as the climate warms, polar bears are constrained in that the very existence of their habitat is changing and there is limited scope for a northward shift in distribution. Due to the long generation time of polar bears and the current pace of climate warming, we believe it unlikely that polar bears will be able to respond in an evolutionary sense. Given the complexity of ecosystem dynamics, predictions are uncertain but we conclude that the future persistence of polar bears is tenuous. (emphasis added).

Since 2004, several dramatic trends have emerged. First, the Arctic sea ice melt has accelerated far beyond what was predicted even just several years ago, and second, impacts to polar bear populations have increasingly been documented, including both those that were predicted by Derocher et al. (2004) and additional impacts that were not expected.

This rapid warming of the Arctic is reflected in the devastating melt of the Arctic sea ice, which is highly sensitive to temperature changes. Summer sea-ice extent reached an unpredicted and utterly stunning new record minimum in 2007 (Stroeve et al. 2008; NSIDC 2007a,b; Figure 1)

Figure 1: Sea ice concentration for September 2007, along with Arctic Ocean median extent from1953 to 2000 (red curve), from 1979 to 2000 (orange curve), and for September 2005 (green curve). September ice extent time series from 1953 to 2007 is shown at the bottom.

Source: Stroeve et al. (2008:13 (Figure 1)).

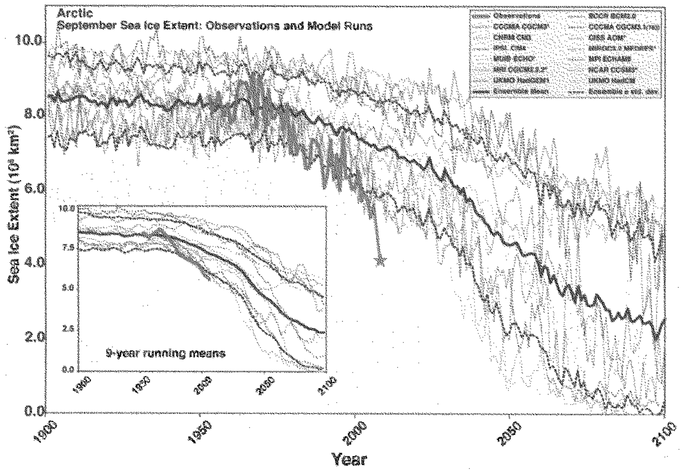


At 1.63 million square miles, the minimum sea-ice extent on September 16, 2007 was about one million square miles[1] below the average minimum sea ice extent between 1979 and 2000 (NSIDC 2007a), and 50% lower than conditions in the 1950s to the 1970s (Stroeve et al. 2008). The 2007 minimum was lower than the sea-ice extent most climate models predict would not be reached until 2050 or later (Figure 2). Leading sea ice researchers now believe that the Arctic could be completely ice free in the summer as early as 2030 (Stroeve et al. 2008).

---

[1] One million square miles is equal to about the area of Alaska and Texas combined.

Figure 2: Arctic Summer Sea Ice Extent: Observations Compared to Model Runs
Source: After DeWeaver (2007); Stroeve et al. (2007).



Since 2004 scientists have also documented increasing impacts to polar bears. The Western Hudson Bay polar bear population has now declined by 22% — from 1,194 bears in 1987 to 935 bears in 2004 (Aars et al. 2006). The researchers attribute this decline to "increased natural mortality associated with earlier sea ice breakup and to the continued harvest of approximately 40 polar bears per year (Lunn et al. 2002), which at some point ceased to be sustainable" and found no support for alternative explanations (Regehr et al. 2007:2680). Regehr et al. (2007) predict that the more northerly polar bear populations will experience declines similar to those observed in Western Hudson Bay.

The Southern Beaufort Sea population is now also classified by the Polar Bear Specialist Group ("PBSG") as declining (Aars et al. 2006:34). The population was estimated at 1,800 bears in 1986 and at 1,526 bears between 2001-2006 (Aars et al. 2006).[2] The Southern Beaufort Sea population has also experienced statistically significant declines in cub survival, cub skull size, and adult male weight and skull size, the same types of declines observed in Western Hudson Bay prior to the population decline (Regehr et al. 2006).

Regehr et al. (2006:14) report several instances of polar bear starvation in the Southern Beaufort Sea population in the spring of 2006:

---

[2] While the overlap of the more recent study's confidence interval with the previous point estimate prohibits an unequivocal statistical conclusion that he sub-population has declined, multiple lines of evidence indicate a population in decline (Aars et al. 2006).

> In spring of 2006, three adult female polar bears and one yearling were found dead. Two of these females and the yearling had depleted their lipid stores and apparently starved to death. Although the third adult female was too heavily scavenged to determine a cause of death, her death appeared unusual because prime age females have had very high survival rates in the past (Amstrup and Durner, 1995).

Figure 3: Polar Bear in the Final Stages of Starvation
(Photo by Heiko Wittenborn).

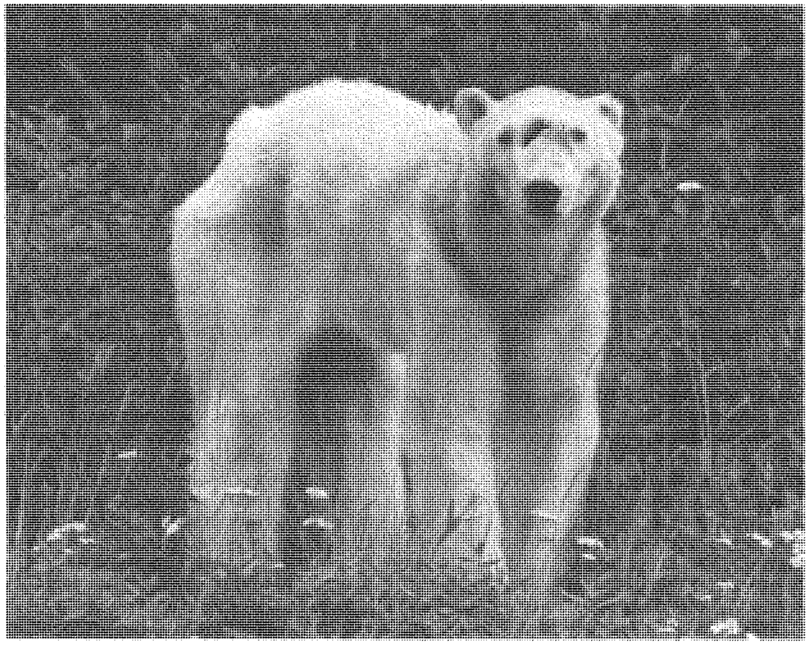


Figure 3 shows a polar bear in the final stages of starvation. This photo was taken on September 4, 2007 on the Caniapiscau River in Canada, 160 km inland from Ungava Bay. While we cannot say for sure that this bear starved to death as a direct result of global warming, as we do not know the bear's history or origin, we do know that global warming will increase the number of bears that suffer this fate.

Polar bear experts have also observed evidence of male polar bears killing and consuming two adult female polar bears and one yearling male in early spring 2004 (Amstrup et al. 2006). These experts state

> During 24 years of research on polar bears in the southern Beaufort Sea region of northern Alaska and 34 years in northwestern Canada, we have not seen other incidents of polar bears stalking, killing, and eating other polar bears. We hypothesize that nutritional stresses related to the longer ice-free seasons that have occurred in the Beaufort Sea in recent years may have led to the cannibalism incidents we observed in 2004 (Amstrup et al. 2006).

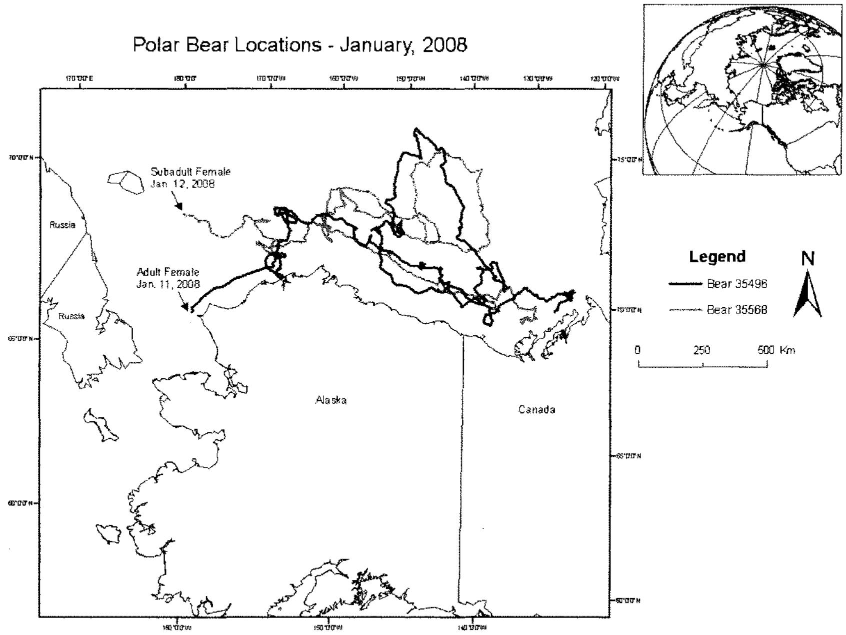
Stone and Derocher (2007) reported an additional incident of polar bear cannibalism in summer 2006 in Svalbard, Norway. An adult male bear in poor physical condition killed and ate a seven month old cub while both the polar bear mother and zodiacs full of tourists watched (Stone and Derocher 2007). The authors ascribe the incident to nutritional stress (Stone and Derocher 2007).

Impacts that were not previously predicted have been observed as well. In 2004, researchers with the U.S. Minerals Management Service observed the carcasses of four bears that had drowned in the Beaufort Sea during a period of high winds and rough seas between 10 and 13 September 2004 (Monnett and Gleason 2006). Because these scientists were able to observe only a relatively small area during their aerial surveys, they estimate via spatial extrapolation that 27 bears may have died during this time period (Monnett and Gleason 2006). Lone females and females with cubs may also be particularly prone to mortality during long-distance travel in open water, leading to "rather serious population-level implications" (Monnett and Gleason 2006). They conclude

> Our observations of higher numbers of swimming polar bears in open water than previously supposed should be considered by analysts and managers relative to marine transportation, ice-breaking, oil and gas development and other potential activities in open water (Monnett and Gleason 2006).

While the scientific publication process often leads to a delay between the observation of impacts and the transmission of that information to the public, media, and decisionmakers, it is apparent that further changes, both those previously predicted and those not anticipated, continue to occur. For example, this year researchers tracking radio collared bears in Canada have observed movements on a scale that is unprecedented, including the movement of bears from the Canadian portion of the Southern Beaufort Sea population into the Chukchi Sea (A. Derocher, pers.com.; Figure 4). While it is too early for scientists to draw firm conclusions from these preliminary observations (A. Derocher, pers. com.), this is further evidence of an ecosystem and species undergoing rapid change. One of the world's leading polar bear scientists stated on 14 January 2008 "My sense is that the 'traditional' movement patterns aren't possible now given the massive melt this past summer" (A. Derocher, pers. com.).

Figure 4: Selected Locations of Bears 35496 and 35568 through 12 January 2008
Source: Andrew Derocher, unpubl. data.



In 2007, the U.S. Fish and Wildlife Service ("FWS") requested that the Department of Interior's U.S. Geological Survey (USGS) address a series of research questions relating to the status of the polar bear. The FWS asked the USGS to do the following in support of the listing process: (1) develop population projections for the Southern Beaufort Sea polar bear population and analyze existing data on two polar bear populations in Canada; (2) evaluate northern hemisphere sea-ice projections, as they relate to polar bear sea-ice habitats and potential future distribution of polar bears; and (3) model future range-wide polar bear populations by developing a synthesis of the range of likely numerical and spatial responses to sea-ice projections. The USGS produced nine administrative reports addressing these questions and in doing so significantly advanced the understanding of sea-ice loss and its implications for polar bears.

To address the question of the future status of the polar bear in a warming Arctic, the USGS conducted polar bear population modeling based on 10 general circulation models ("GCMs," or "climate models") that most accurately simulate future ice conditions (Amstrup et

---

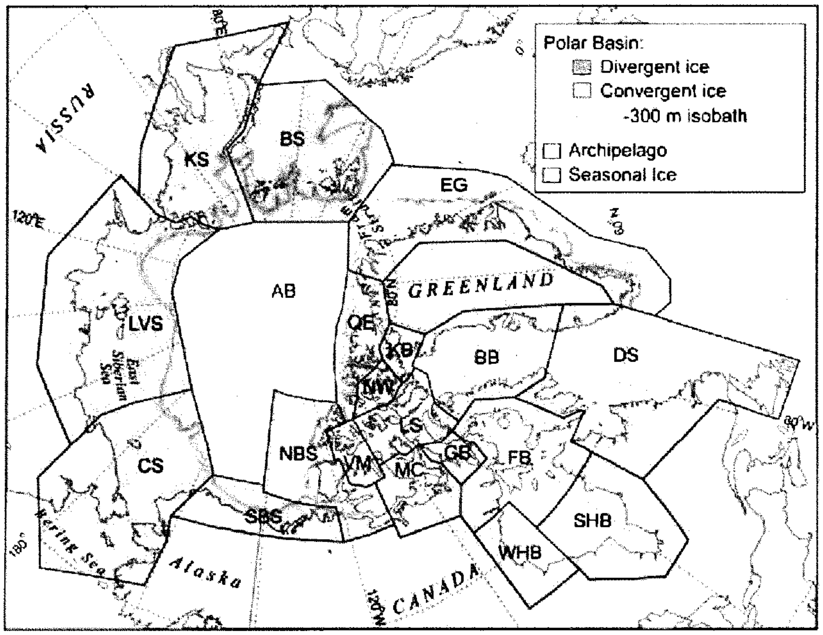
[3] See http://ice-glaces.ec.gc.ca/App/WsvPageDsp.cfm?id=11892&Lang=eng.

al. 2007). The USGS used the Intergovernmental Panel on Climate Change ("IPCC") A1B "business as usual" scenario of future emissions to run the climate models (Amstrup et al. 2007). In the A1B scenario, atmospheric carbon dioxide concentrations reach 717 parts per million by 2100.

The USGS divided the world's polar bear populations into four ecological regions:

> The (1) Seasonal Ice Ecoregion which includes Hudson Bay, and occurs mainly at the southern extreme of the polar bear range, (2) the Archipelago Ecoregion of the Canadian Arctic, (3) the Polar Basin Divergent Ecoregion where ice is formed and then advected away from near-shore areas, and (4) the Polar Basin Convergent Ecoregion where sea ice formed elsewhere tends to collect against the shore (Amstrup et al. 2007:1).

Figure 5: Map of Polar Bear Ecoregions used by USGS
Source: Amstrup et al. (2007:82).



The USGS projected the future range-wide status of polar bears using both a deterministic model of past, current, and future polar bear carrying capacity which assumed a linear relationship between bear density and annual average sea ice extent," and a Bayesian network model that combined "empirical data, interpretations of data, and professional judgment into a probabilistic framework" (Amstrup et al. 2007:1). The deterministic model did not include seasonal changes in ice availability or other stressors, and thus provided an optimistic view of the impact of sea ice loss on polar bear populations (Amstrup et al. 2007). The Bayesian network model did incorporate information about annual and seasonal sea ice loss as well as other population stressors and thus provides a more realistic projection of future impacts (Amstrup et al. 2007). The "overall outcome" of the Bayesian network model was "a statement of the relative probabilities that the population in each ecoregion would be larger than now, same as now, smaller, rare, or extinct" (Amstrup et al. 2007:15). The results of the USGS study are profoundly disturbing.

The USGS projects that polar bears will be extinct in the Seasonal Ice and Divergent Ice ecoregions by the middle of this century (Amstrup et al. 2007). These two ecoregions account for two thirds of the world's polar bears, including all of the bears in Alaska. The "good news" is that polar bears may survive in the high Canadian Archipelago and portions of the Convergent Ice ecoregion through the end of this century. However, their extinction risk is still extremely high: over 40% in the Archipelago and over 70% in Northwest Greenland (Amstrup et al. 2007:66-67 (Table 8)). Moreover, the most likely outcome for each of these ecoregions by the end of this century is also extinction (*Id.*).

Table 1 displays a subset of the output from the USGS Bayesian Network model. Projections are given only for the ensemble mean ("middle of the road") sea ice projections of the 10 climate models used. The most likely (or "dominant") outcome and the probability of extinction at year 45 and year 100 for reach of the four ecoregions are displayed.

Table 1: **Most Likely Modeled Outcome and Probability of Extinction for Each of the Four Polar Bear Ecoregions Based on the Ensemble Mean Projections of the 10 Climate Models** (Source: Amstrup et al. (2007:66-67 (Table 8)).

Ecoregion	**Time Period**	**Most Likely Outcome**[a]	**Probability of Extinction**
Seasonal Ice	Year 45	EXTINCT	77.19%
	Year 100	EXTINCT	88.15%
Divergent Ice	Year 45	EXTINCT	80.33%
	Year 100	EXTINCT	83.89%
Convergent Ice	Year 45	EXTINCT	35.06%
	Year 100	EXTINCT	77.30%
Archipelago	Year 45	SMALLER	10.56%
	Year 100	EXTINCT	41.07%

[a] Outcome possibilities for the model are "larger than now," "same as now," "smaller," "rare," or "extinct."

In addition, the USGS emphasizes that because all of the available climate models have to date underestimated the actual observed sea-ice loss, the assessment of risk to the polar bear may be conservative (*e.g.* Amstrup et al. 2007:34,36). Perhaps most worrisome is the observation that part of an area in the Canadian Archipelago expected to provide an icy refuge for the polar bear in 2100 lost its ice in the summer of 2007 (Amstrup et al. 2007:35,96).

The USGS projections of polar bear extinction risk are based on the IPCC A1B "business as usual" scenario, near the center of the distribution of all IPCC scenarios, in which atmospheric carbon dioxide concentrations reach 717 parts per million by 2100 (Nakićenović 2000). If future emissions meet or exceed the A1B scenario, the eventual extinction of polar bears is virtually guaranteed, as extinction risk will exceed 40% even in the high Canadian Archipelago in 2100, and warming will continue after 2100. The USGS reports, however, do not address the question of how much polar bear extinction risk can be reduced if greenhouse gas emissions are curtailed significantly below those assumed in the A1B scenario. Decreasing greenhouse gas emissions substantially can limit the Arctic sea-ice melt and therefore lower extinction risk for the polar bear.

While not explicitly making an Endangered Species Act listing recommendation, the information contained in the USGS reports, together with the substantial body of relevant peer reviewed literature and additional data and observations, definitively answers the question of whether the polar bear is in fact in danger of extinction and therefore warrants the protections of the Act with an emphatic "yes."

II. The Administration's Unlawful Delay of the Endangered Species Act Listing Process for the Polar Bear fits a Pattern of Political Interference in the Listing Program

For the past seven years, the Bush administration has implemented the Endangered Species Act in a manner that undermines, minimizes and eviscerates fundamental protections for the nation's most imperiled wildlife. Political appointees in the administration have consistently interfered in the scientific process with the express purpose of limiting protections for endangered species. They have delayed decisions, bullied government scientists, violated the law, and ignored public concern for the conservation of wildlife. As noted in the first part of this section, all of these elements have been present in the effort to list the polar bear. The second part of this section places the polar bear situation in a broader Endangered Species Act implementation context through a review of the administration's obstruction and interference in three critical aspects of implementation of the Endangered Species Act: protection of new species as endangered, designation of critical habitat, and development and implementation of recovery plans. The administration's malfeasance in these areas has already led to the extinction of species. Further interference in the listing process for the polar bear should not be tolerated.

A. The Administration Has Unlawfully Delayed and Interfered in the Endangered Species Act Listing Process for the Polar Bear

1. Delay and Censorship

The Center for Biological Diversity submitted a Petition to the Secretary of the Interior and FWS to list the polar bear under the Endangered Species Act due to global warming on February 16, 2005. The Petition initiated the listing process which is conducted pursuant to strict timelines. An initial finding on the petition is due within 90 days of the petition, a proposed rule within 12 months of the petition if the FWS finds that the species meets the criteria for listing, and a final listing determination must be published in the Federal Register within one year of publication of the proposed rule. 16 U.S.C. § 1533. Species do not receive any regulatory protection under the Act until they are officially listed as threatened or endangered.

In December 2005, ten months after the Petition was filed, the administration had yet to make the first required "90-Day" finding. The Center for Biological Diversity, joined by the Natural Resources Defense Council ("NRDC") and Greenpeace, sued the Department of Interior for failing to issue an initial finding on the Petition. In response, a positive initial finding was issued in February, 2006, initiating both a public comment period and full status review for the species. The deadline for the second required finding on the Petition, due within 12 months of receipt of the petition, was only one week away at the time the first finding was made. The lawsuit was ultimately settled with a consent decree setting a deadline of December 27, 2006 for the FWS to make the second determination.

On December 27, 2006, Secretary of Interior Dirk Kempthorne announced that the polar bear met the criteria for listing as "threatened," and that the FWS would be publishing a proposed listing rule. The proposed rule was published in the Federal Register on January 9, 2007.

Political meddling in the listing process was first revealed at this time. Apparent attempts by the administration to stifle discussion of the role of anthropogenic greenhouse gas emissions and global warming in the decline of the polar bear seem to have resulted in discrepancies between the Status Review (Schliebe et al. 2006), the scientific document that formed the basis for the proposed rule, and the proposed rule itself. Inconsistencies in the communications from high level appointees at the FWS and Department of Interior, as detailed below, also reveal improprieties.

A listing proposal by law must examine the five Endangered Species Act listing factors:

1. The present or threatened destruction, modification, or curtailment of its habitat or range;
2. Overutilization for commercial, recreational, scientific, or educational purposes;
3. Disease or predation;
4. The inadequacy of existing regulatory mechanisms;
5. Other natural or manmade factors affecting its continued survival.

15 U.S.C. § 1533(a).

The first requires identification of the cause of endangerment; the fourth requires an examination of existing regulations related to that cause. The polar bear listing proposal, however, appears unique among the thousands of listing decisions issued over the last 33 years in completely failing to identify the cause of the polar bear's imperilment. It presents a comprehensive analysis of past and current sea ice melt, but conspicuously fails to identify what is causing the Arctic to warm so dramatically. There is no discussion of global warming or greenhouse gases.

Similarly, while the proposal discusses all relevant national and international regulations and efforts regarding hunting, oil and gas drilling, toxic contamination and disturbance, it does not discuss any national or international greenhouse gas regulations or initiatives. It correctly concludes that "...there are no known regulatory mechanisms currently in place at the national or international level effectively addressing threats to polar bear habitat," but does not elaborate.

In his opening statement at the December 27th press conference, Secretary Kempthorne stated that global warming and its causes are "beyond the scope" of the government's efforts to protect the polar bear via the Endangered Species Act:

> "While the proposal to list the species as threatened cites the threat of receding sea ice, it does not include a scientific analysis of the causes of climate change. That analysis is beyond the scope of the Endangered Species Act review process which focuses on information about the polar bear and its habitat conditions including reducing ice (FWS 2006:3)."

Secretary Kempthorne clearly told the media that FWS scientists ***did not*** analyze the causes of global warming or the adequacy of the administration's greenhouse gas emissions policy. Director Hall went so far as to thrice state that the scientists ***could not*** do so because they lacked the expertise:

> "Sir, to be honest with you, we don't have the expertise in the Fish & Wildlife Service to make those kinds analysis [sic]. We're biologists by trade and so, we deal with the fact they're out on the landscape. And in this case, we're dealing with the fact of reducing ice and that's what we're able to analyze (FWS 2006:16-17)."

The Status Review had of course been completed before the press conference, but was not supplied to the public or the media until several weeks afterward. The Review itself states:

> "The purpose of the status review/assessment is to obtain, synthesize, and evaluate the best available scientific and commercial data on the status of the polar bear and threats thereto. Information in the status assessment is to form the basis for the next finding the Act requires the Service to make, the 12-month finding [i.e. the proposal] that the petitioned action is either: (1) warranted; (2) not warranted; or (3) warranted but precluded."

Much of the listing proposal was cut and pasted out of the Status Review and the two documents are structured very similarly. They differ, however, in that the Status Review contains the exact analyses that Secretary Kempthorne and Director Hall claimed were not and could not be performed by the FWS. It appears that these officials may have systematically censored all references to global warming, greenhouse gases, and the administration's failed emission policies out of the listing proposal, and then told the media that the analyses had never been conducted. Table 2 displays the number of times that keywords relating to global warming were used in the Status Review, compared to the number of times they were used in the Proposed Rule. The Status Review includes four references to CO_2, nine to greenhouse gases, 20 to global warming, and 24 to emissions. All of these were excluded from the listing proposal. So were 74 of the 83 references to climate change.

Table 2: Number of Keyword References in the Status Review and Proposed Rule
Source: Center for Biological Diversity Analysis of the Status Review and Proposed Rule.

Keyword(s)	Status Review	Proposed Rule
Climate Change	83	9
Greenhouse or Green House	9	0
CO_2	4	0
Emissions (in relationship to greenhouse gases)	24	0
Global Warming	20	0
Kyoto	4	0
United Nations Framework Convention on Climate Change or UNFCCC	15	0
White House	1	0
IPCC	17	3
U.S. Climate Change Science Program	1	0

The proposed rule itself states: "Further, the analysis conducted for the polar bear status assessment and proposed rule has been a significant and jointly-coordinated effort of fiscal, intellectual, and other resources among the Service and the USGS, NASA, species experts, and experts in other fields such as contaminants." 72 Fed. Reg. 1096. FWS scientists clearly have the expertise to conduct inter-disciplinary analyses and to coordinate with their colleagues at NASA and other agencies who have additional expertise in climate science and other fields relevant to the polar bear status review. For the Director of the FWS to suggest that agency scientists "[lack] the expertise" to conduct the high quality, thorough, and impressive analysis they had just completed is exceptionally strange behavior at best.

To fulfill the Endangered Species Act mandate to determine if existing regulatory mechanisms are adequate, the Status Review has a section entitled "Mechanisms to Regulate Climate Change." It examines the 1992 United Nations Framework Convention on Climate Change, finding that "To date, the goals set by the Framework have not been met." It examined the 1997 Kyoto Protocol, finding that it would only "slightly reduce the rate of growth of emissions and would only make a small contribution to stabilizing the level of emissions in the atmosphere." It also concluded that "mechanisms for enforcement of emission reductions have not yet been tested and there are no financial penalties or automatic consequences for failing to meet Kyoto targets." Domestically, it concludes that the strategy developed by the White House Office of Science Technology and Policy will actually allow continued increases in greenhouse gas emissions because while "emissions intensity could decrease the total emissions would still increase."

The listing proposal changed the name of this section to "Mechanisms To Regulate Sea Ice Recession," shortened it to a single paragraph and deleted all references to greenhouse gas policies. The section now reads in total:

> "Regulatory mechanisms directed specifically at managing threats to polar bears exist in all of the range states where the species occurs, as well as between (bilateral and multilateral) range states. There are no known regulatory mechanisms effectively addressing reductions in sea ice habitat at this time."

Sea ice recession by definition can not be regulated. Its cause — greenhouse gases — can be regulated, but the Bush administration has steadfastly opposed all such efforts to do so, and apparently excised the scientists' analysis prior to publication of the proposed rule. Saying that polar bears are threatened by sea ice recession without discussing global warming is like saying a species that is threatened by hunting is threatened by "rapidly flying bits of lead" and that there are no known regulatory mechanisms regulating "flying bits of lead," without discussing hunting.

The Status Review contains a section entitled "Projected Changes in Arctic Climate" which after examining the detrimental impacts likely to occur from continued global warming, states that the "warming trend would change considerably if actions were taken soon enough to keep the atmospheric gases from increasing (Schliebe et al. 2006:67)." The listing proposal changed the name of this section to "Projected Changes in Sea Ice Cover" and removed the reference to limiting greenhouse gas emissions or altering the current trajectory of warming.

While the Status Review explains Arctic warming in relationship to carbon emissions (see, e.g. Schliebe et al. 2006: 66: "The globally averaged surface temperature is projected to increase by somewhere between 1.4 and 5.8° C over the period 1990 to 2100 depending on model parameters and the assumptions made on future CO2 emissions"), the listing proposal does not discuss the cause of Arctic warming.

Around the same time as the proposed rule was announced, the administration also attempted to block scientists traveling abroad from discussing polar bears, sea ice, or climate change (FWS 2007). A March 2, 2007 email from Richard Hannon, Acting Alaska Regional Director to Alaska Region Staff, stated:

> Please be advised that all foreign travel requests (SF 1175 requests) and any future travel requests involving or potentially involving climate change, sea ice, and/or polar bears will also require a memorandum from the Regional Director to the Director indicating who'll be the official spokesman on the trip and the one responding to questions on these issues, particularly polar bears, including a statement of assurance that these individuals understand the Administration's position on these issues (FWS 2007).

In sum, while the proposed rule accurately determined that the polar bear qualifies for listing under the Endangered Species Act, inappropriate intrusion of politics into the listing process is readily apparent.

2. Failure to Propose Critical Habitat for the Polar Bear

Critical habitat, or the areas "essential to the conservation of the species" that "may require special management considerations or protection," provides substantial additional protection to listed species and must be designated at the time a species is listed. 16 U.S.C. § 1533(b)(6)(C). A final critical habitat designation may only be delayed if the agency finds that designation would be "not prudent" or "not determinable."

The proposed rule to list the polar bear stated that critical habitat designation was "not determinable," stating as follows:

> ...in general the identification of specific physical and biological features and specific geographic areas for consideration as critical habitat is complicated and the future values of these habitats may change in a rapidly changing environment. The polar sea ice provides an essential conservation function for the key life history functions for hunting, feeding, travel, and nuturing [sic] cubs. That essential habitat is projected to be significantly reduced within the next 45 years, and some projections forecast complete absence of sea ice during summer months in shorter time frames. A careful assessment of the designation of critical marine areas will require additional time and evaluation. In addition, near-shore and terrestrial habitats may qualify as critical habitat; however a careful assessment will require additional time and evaluation. Therefore, there is a degree of uncertainty at this time as to which specific areas in Alaska might be essential to the conservation of the species and thus meet a key aspect of the definition of critical habitat. Consequently, the designation of critical habitat for the polar bear is not determinable at this time...If the listing of the polar bear becomes final, we will then consider whether to propose the designation of critical habitat."

72 Fed. Reg. 1096-1097.

It is highly improper to deny the polar bear the additional protections of critical habitat based on the rapid warming of the Arctic, the very factor that endangers the species in the first place.

The publication of the proposed rule triggered a January 9, 2008 statutory deadline for publication of the final listing determination. On January 7, 2008, Dale Hall, Director of the FWS, announced that the listing decision would be delayed. While Mr. Hall did not give a firm date for publication of the final listing determination, he stated that he hoped the decision would be announced within the next thirty days. Mr. Bruce Woods, a FWS spokesman in the Alaska region, was quoted in the San Francisco Chronicle as saying that the listing determination had left the Anchorage field office on December 14, 2007 (Kay 2008).

The Endangered Species Act listing process is designed to take no more than 2 years between receipt of a petition to list and a final listing determination. It has now been nearly three years since the Petition to list the polar bear was submitted on February 16, 2007. All listing decisions must be based solely on the basis of the best scientific information available. There is simply no justification for delay now that agency scientists have finished their work. The administration's unlawful delay in issuing the final listing decision, while at the same time it is rushing to lease over 46,000 square miles of polar bear habitat in the Chukchi Sea for oil and gas development, is illegal. The delay also fits a pattern of severe and pervasive political interference in the Endangered Species Act listing process.

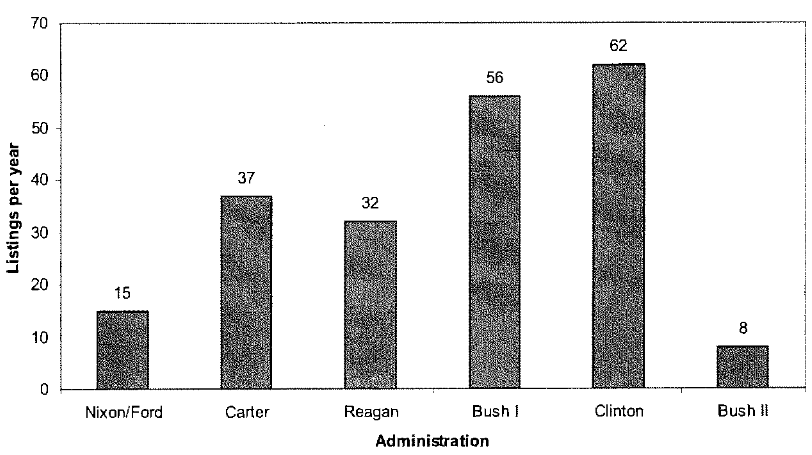
B. An Epidemic of Political Meddling in the Endangered Species Act Listing Process

For the past seven years, the Bush administration has implemented the Endangered Species Act in a manner that undermines, minimizes and eviscerates fundamental protections for the nation's most imperiled wildlife. Political appointees in the administration have consistently interfered in the scientific process with the express purpose of limiting protections for endangered species. They have delayed decisions, bullied government scientists, violated the law, and ignored public concern for the conservation of wildlife. The following discussion reviews the administration's obstruction and interference in three critical aspects of implementation of the Endangered Species Act: protection of new species as endangered, designation of critical habitat, and development and implementation of recovery plans. The administration's malfeasance in these areas has already led to the extinction of species. Further interference in the listing process for the polar bear should not be tolerated.

1. The Bush Administration has Essentially Halted Protection of New Species as Threatened or Endangered

Listing of species as threatened or endangered is the keystone of the U.S. Endangered Species Act because it is only after species are listed that they receive the substantial protections provided by the Act. Over the past 7 years under the Bush administration, listing of species has dropped to the lowest level since the Act was passed and far below any other administration (Figure 6). Since the administration took over in 2001, the FWS has listed just 50 species for a rate of eight species per year. By comparison, the Clinton administration listed 512 species for a rate of 62 species per year and the first Bush administration listed 234 species for a rate of 56 species per year.

Figure 6. Rate of U.S. Fish and Wildlife Service Endangered Species Act listings by presidential Administration.



And Secretary Kempthorne, appointed on May 26, 2006, has essentially shut down the listing process all together. On January 17, 2008, the FWS will not have listed a single new species for 618 days, the longest such delay in the history of the Endangered Species Act. The second longest delay was in 1981, when then Secretary of the Interior James Watt went 382 days without protecting a new species. In response to this shorter delay, Congress quickly responded by amending the Act in 1982 to include firm deadlines for protecting those species.

This sharp drop in the number and rate of species listings is not due to a shortage in the number of deserving species. To the contrary, there are currently 279 species that are candidates for listing that have on average been waiting nearly 19 years for protection.[4] Many of these species, including the elfin woods warbler, mountain yellow-legged frog, and New England cottontail rabbit, are on the brink of extinction.

The consequences of delayed protection are severe, allowing species to decline, making recovery more costly and difficult, and in a number of cases resulting in species extinction. Indeed, at least 25 species have become extinct after being recognized as a candidate species

---

[4] The FWS began keeping lists of species that warrant review in 1974 and candidate lists in 1980. Prior to 1996, the agency had several categories of candidate species (e.g. C1, C2, C3) based on the available information. Because all of these categories required additional action on the part of the agency, we have calculated wait time based on the first date a species was added regardless of category. In 1996, only category 1 species were maintained on the candidate list.

(Suckling et al. 2004). One of these extinctions was announced as recently as October, 2006, when the FWS concluded that there are "no extant wild individuals and there is no material in genetic storage" of the Hawaiian plant "Haha" (*Cyanea eleeleensis*) and thus that the species "appears to be extinct."[5] Another species extinction on Bush's watch is the summer-run of the Lake Sammamish Kokonee, which formerly lived in Washington State's second largest lake, and is now believed to be extinct after the administration ignored a petition to emergency list the population (Greenwald 2007). A Hawaiian bird called the Akikiki or Kauai creeper, which is only found on the island of Kauai primarily in the Alakai Swamp, may also be nearing extinction (Greenwald 2007).

In the few cases where the administration has been forced to make decisions about whether to protect candidate species by court orders, they have reversed previous determinations and denied the species protection, including decisions over the Montana fluvial arctic grayling, Gunnison sage grouse and others (Greenwald 2007).

Lack of funding and litigation are not to blame for the administration's poor record protecting species, as this has occurred despite substantial increases in funding for the listing program. From 2000 to 2006, the listing budget increased from $6,208,000 to $17,630,000, which is a 280% increase. Since 2002, Congress has capped the amount of listing dollars that can be spent on critical habitat, providing a dedicated source of funding for listing of new species. This dedicated funding has increased from $3,077,000 in 2002 to $4,778,000 in 2006, which is a 55% increase.

With increased funding and decreased efficiency, the number of species protected per dollar has declined dramatically under the Bush Administration. The FWS listed nearly 30 species per million dollars in 1997 and over seven species per million in 1998. Between 2002 and 2006, in contrast, the agency listed an average of just 2.4 species per million dollars of budget.[6] Had the agency maintained efficiency, they would have listed 563 species between 2002 and 2006 based on the 1997 rate and 136 species based on 1998 rate, instead of the 44 species they actually listed.

FWS officials have repeatedly claimed the reason they are not protecting more species, particularly candidate species, is because they are flooded by litigation and court orders to conduct other listing activities. Under the Clinton Administration, however, the agency completed substantially more listing determinations under court order and still managed to complete hundreds of non-court ordered listing determinations. Between 1995 and 2001, the agency completed 290 court ordered determinations, as well as an additional 402 other determinations.[7] Since 2001, in contrast, the agency has only completed 178 court ordered listing determinations, and only 28 non-court ordered determinations. These numbers clearly indicate that litigation is not the reason the agency has listed so few species in the last six years.

---

[5] U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates or Proposed for Listing as Endangered or Threatened, Federal Register: September 12, 2006, Volume 71, Number 176, Page 53806

[6] We used 1997, 1998 and 2002-2006 because in these years it is possible to determine the budget for listing independent of critical habitat.

[7] A listing determination is a decision whether to not list (negative) or list (positive) an individual species, and includes 90-day, 12-month, and final listing decisions. One listing rule can contain determinations for multiple species.

In reality, the administration is making so little progress protecting new species because of the opposition of political appointees in the Department of Interior, who have slowed decision making with multiple reviews and edits and bullied agency scientists to reverse their conclusions. Documents obtained by the Center for Biological Diversity and others through the Freedom of Information Act reveal that Department of Interior officials interfered with – and in many cases, reversed – FWS biologists' recommendations to list species as "threatened" or "endangered" under the Act, including decisions concerning Gunnison sage-grouse, greater sage-grouse, Mexican garter snake, marbled murrelet, Delta smelt, wolverine, trumpeter swan, Gunnison's prairie dog, white-tailed prairie dog, and roundtail chub.

Delay and interference have effectively closed the gates to protection of new species under the Endangered Species Act. Overall, the agency issued far fewer listing determinations, as discussed above, and a greater proportion of negative determinations since 2001 than in the previous six years (1995-2001). Of the 692 listing determinations completed between 1995-2001, only 13% denied protection to species. Of the 206 listing determinations issued since 2001, 52% denied protection to species. This quadrupling in the rate of negative determinations is reflective of the Administration's opposition to protecting species under the Endangered Species Act and indicative of the degree to which politics is overriding important decisions concerning the protection of the nation's wildlife.

Interference in listing determinations to the detriment of species protection is also demonstrated by a recent survey of FWS biologists conducted by the Union of Concerned Scientists. The survey found that nearly half of all respondents whose work is related to endangered species scientific findings (44 percent) reported that they "have been directed, for non-scientific reasons, to refrain from making jeopardy or other findings that are protective of species" (UCS 2005).

Political pressure and bullying of agency scientists to reverse their conclusions to protect species was also recently documented in a report by the Inspector General of the Department of Interior, which found that Assistant Secretary of Fish, Wildlife and Parks Julie MacDonald, who has no biological training, rode roughshod over numerous decisions by agency scientists concerning protection of the nation's endangered species (OIG 2007). The report also found that MacDonald violated federal rules by sending internal documents to industry lobbyists (OIG 2007).

In the OIG report, numerous former and current high level staff of the FWS stated that MacDonald's interference in scientific decisions concerning endangered species was pervasive, aggressive, designed to limit protection and exposed the agency to litigation over poorly supported and politically motivated decisions (OIG 2007). The former director of endangered species, for example, concluded that MacDonald "regularly bypassed managers to speak directly with field staff, often intimidating and bullying them into producing documents that had the desired effect" and that "the overall effect was to minimize the Endangered Species Act as much as possible or ensnare it in court litigation, which often happened" (OIG 2007).

Following release of the OIG report, Ms. MacDonald resigned and the FWS stated its intention to review Endangered Species Act determinations for eight species for political interference. Following that review, the FWS stated its intention to "revise" decisions relating to seven of the species, but made no firm commitment to do so, making statements including that the work will be undertaken "as funding becomes available."[8] This inadequate response has not addressed the problem. The Center for Biological Diversity has identified an additional 55 species where political interference appears to have occurred, and which the administration has refused to address.

Political interference from the Bush administration has repeatedly been overturned by Courts. In one case in which the administration was under a court order to make a final listing determination for the California tiger salamander, the FWS sought and received additional time from the Court to meet the deadline. In later overturning the reclassification of two populations of the salamander from "endangered" to "threatened," the Court noted that the extension had been used instead simply for political interference.

> While FWS argued that it needed the extension to resolve a factual discrepancy over the extent of any decrease in grazing land for the Central California tiger salamander, it is now evident, upon review of the transcript of the hearing and the administrative record, that FWS was simply buying time to draft a final rule that also incorporated the down-listing of the Santa Barbara County and Sonoma County tiger salamander populations.[9]

In sum, despite increased funding and hundreds of species in need of immediate protection, the Bush administration has engineered a near collapse in protection of new species as threatened or endangered under the Endangered Species Act. The unlawful delay in the polar bear listing decision fits this pattern of political interference and raises concerns that political appointees will use the delay to tamper with the conclusions of agency scientists.

2. *The Bush Administration has Slashed Critical Habitat Designations and Interfered in Recovery Planning*

One of the most important protections for many listed threatened and endangered species is the designation of critical habitat. In particular, critical habitat allows for the protection of areas where species do not currently reside, but could one day do so, and is thus a key tool for recovery of species. A recent study found that listed species that had critical habitat for two or more years were more than twice as likely to have an improving status and less than half as likely to be declining than listed species without critical habitat (Taylor et al. 2007).

Throughout much of the late 1980s and 1990s, the FWS did not routinely designate critical habitat for listed species, despite a clear statutory mandate. Beginning in the late 1990s conservation organizations began suing to obtain critical habitat for species before being barred by the statute of limitations. Unfortunately, the great majority of these designations (387) have been under the direction of the Bush Administration. Unable to stop the flow of court orders to designate and protect critical habitat areas, the Bush Administration has resorted to drastically scaling back the size of critical habitats.

---

[8] Letter from Kenneth Stansell, Acting Director, U.S. Fish and Wildlife Service, to the Honorable Nick J. Rahall, II, Chairman, Committee on Natural Resources, House of Representatives, dated Nov. 23, 2007.

[9] August 19, 2005 Order in *Center for Biological Diversity et al. v. U.S. Fish and Wildlife Service et al.*, No. 04-4324 (WHA) (N. Dist. Cal.)

In general, proposed critical habitats were developed by field-level staff who are familiar with the particular species in question and have been fairly inclusive of species habitat. Proposed critical habitat under the Bush administration included nearly 120 million acres with an average of over 310,000 acres per species. Final critical habitats, however, included only just over 48 million acres with an average of only 125,000 acres per species. On average, critical habitats were reduced by 70% between the proposed and final rules. In total, 90% of all critical habitats were reduced between proposed and final and 14 were canceled all together. Only four were increased and only for a total of 18,544 acres.

In many cases, excluding large tracts of land has made critical habitats practically useless. In 2001, political appointees in Washington DC ordered local FWS biologists to remove 8.9 million acres of proposed critical habitat from the Mexican spotted owl. The result was a designation that excluded 95% of all known owls, 80% of owl habitat, and virtually all areas under threat of logging. An agency biologist objected: "the designation would make no biological sense if the [U.S. Forest Services land] was excluded since these lands are the most essential for the owl." Two years later a federal court agreed, calling the designation "nonsensical."

Another essential protection afforded listed species is the recovery plan, developed by teams of expert scientists and land managers to detail the necessary actions to recover species to the point at which they no longer require the protection of the Endangered Species Act. Recovery plans involve compilation of extensive and highly specific information related to the threats to and status of the species in question, and thus by necessity, recovery teams have historically operated with a fair degree of independence. Recovery plans provide important guidance to federal land management agencies, who must ensure that their actions are consistent with the survival and recovery of threatened and endangered species.

The Bush administration has completed fewer recovery plans than any administration since the Carter administration, has interfered with development of recovery plans to an unprecedented degree, and has ignored recovery plan criteria in a rush to strip species of protection. To date, the Bush Administration has completed just 100 recovery plans, compared to 577 under the Clinton administration and 174 under the first Bush administration.

The administration has also repeatedly interfered in the recovery planning process. For example, in 2004, the Apache Trout Recovery Team, which consists of a diverse group of professional biologists, developed a draft revised recovery plan based on many months of deliberation and consideration of the best available scientific information. This plan, however, did not allow for delisting the species fast enough for then southwest regional director of the FWS Dale Hall, who unbeknownst to team members worked with officials of Arizona Game and Fish to substantially revise the plan. In order to speed delisting of the trout, the new plan lowered population targets, and removed requirements to replicate different genetic lineages.

In response to the revised plan, three respected members of the recovery team sent a letter to Mr. Hall, concluding:

> "As members of the Apache Trout Recovery Team (Team), we are writing you to express our dissent with the ongoing revision of the Apache Trout Recovery Plan. Specifically, we do not believe that the Plan's revised recovery strategies and objectives are sufficient to allow the species to be delisted. We have expressed to the Team our reservations about the Plan's adequacy toward recovering Apache trout on several occasions, yet the Plan continues toward finalization despite our stated concerns. Because our views apparently will not be incorporated into the final Plan, we wanted to make you aware of alternative approaches to the recovery process that are based on the best scientific information available... We believe that implementation of the revised Plan as currently written will not conserve Apache trout according to provisions outlined in ESA, and will eventually result in its further genetic degradation and possible extinction."[10]

Following his decision to ignore recovery team scientists and lower the recovery criteria for the rare Apache Trout, Mr. Hall was promoted to Director of the FWS.

Other species for which interference in the recovery planning process have been documented include the northern spotted owl, West Virginia flying squirrel, Florida manatee, gray wolf, Yellowstone population of the grizzly bear, Gila trout, and marbled murrelet (Greenwald 2007).

Given the administration's widespread practice of illegal political interference in Endangered Species Act decision-making, it is no surprise that the listing process for the polar bear has also been subject to illegal delays and interference.

III. The Endangered Species Act Will Provide Substantial Benefits to the Polar Bear

The Endangered Species Act is our nation's safety net for plants and animals on the brink of extinction, and our strongest and best law for the protection of imperiled wildlife. The Endangered Species Act listing process has already benefited the polar bear, will provide additional protections once the species is formally listed, and has an important role to play in addressing global warming.

The Endangered Species Act listing process has already benefited the species by prompting additional research and analysis on the future of the polar bear, its sea-ice habitat, and the Arctic more generally. Most important among these research efforts are the recent reports released by the USGS, discussed *supra*. In the nine reports produced for the polar bear listing process, the USGS significantly advanced the understanding of sea-ice loss and its implications for polar bears.

The media scrutiny of the listing process has also greatly increased public awareness of the polar bear's plight. The proposal to list the polar bear was greeted by worldwide media attention, resulting in over 250 television stories, more than 1000 print stories and over 240 editorials. Over 680,000 comments were submitted during the public comment periods on the proposal. The Endangered Species Act listing process has helped cement the polar bear as the icon of global warming.

---

[10] Letter from Apache trout recovery team members, Robert Clarkson, Jerry Ward and Alex Puglisi to Regional Director Dale Hall, U.S. Fish and Wildlife Service, March 9, 2005.

The listing process has also forced the administration to confront the science of global warming. The Endangered Species Act requires all listing decisions be made "solely" on the basis of the "best scientific...data available." 16 U.S.C. § 1533(b)(1)(A). A decision not to list a petitioned species is subject to judicial review. It is this "best available science" standard that provides a vehicle through the petitioning process to force the FWS to squarely address the science of global warming. The Bush administration has consistently denied and downplayed the science of global warming for seven years, but cannot ultimately do so in the polar bear listing process without facing a legal challenge that would place the science of global warming squarely before a federal court, and which the administration would almost certainly lose.

While the listing process has already been beneficial, the polar bear will not receive any regulatory protection until it is formally listed. Once this occurs, an array of statutory protections will apply. Two of the primary Endangered Species Act's primary regulatory mechanisms are contained in Sections 7 and 9 of the statute. 16 U.S.C. §§ 1536, 1538. Section 7 directs all federal agencies to "insure through consultation" with FWS (or the National Marine Fisheries Service (NOAA Fisheries) if the listed species is a marine species under that agency's jurisdiction) that all actions authorized, funded, or carried out by such agencies are "not likely to jeopardize the continued existence" or "result in the destruction or adverse modification" of "critical habitat" of any listed species." 16 U.S.C. § 1536(a)(2). In contrast to the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321-4375, which requires only informed agency decision-making and not a particular result, and is therefore strictly procedural, Section 7 of the ESA contains both procedural ("through consultation") and substantive ("insure" the action does not "jeopardize") mandates for federal agencies. As such, the statute, and litigation under it, can force analysis through the consultation process of the environmental effects of a given project and, if the project is determined to jeopardize a listed species or adversely modify its critical habitat, trigger modification or cancellation of the project so as to avoid such impacts.

Consultation under Section 7 results in the preparation of a biological opinion by FWS that determines if the proposed action is likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat. If the action is determined to jeopardize a species or adversely modify its critical habitat, FWS must provide "reasonable and prudent alternatives" that would allow the action to proceed in a manner that avoids jeopardy and adverse modification. In making the jeopardy and adverse modification determinations, FWS or NOAA Fisheries must utilize the "best available science." 16 U.S.C. § 1536(a)(2).

As exemplified in the seminal case *Tennessee Valley Authority v. Hill*, 437 U.S. 153 (1978), the Section 7 consultation process is the heart of the ESA. The Supreme Court stated that Section 7 "admits of no exception," and affords endangered species "the highest of priorities." 437 U.S. at 173-174. Through the Section 7 process, federal agencies should examine the direct, indirect, and cumulative impacts of any action that may impact the polar bear. This includes not only actions that directly harm polar bears or their habitat, but also large sources of anthropogenic greenhouse gas emissions which contribute to global warming. While

Bush administration officials have stated that global warming is "beyond the scope" of the Endangered Species Act, there is no reason greenhouse gas emissions which harm polar bears should be treated any differently than pesticides that harm salmon or logging that harms owls. While clearly we as a society should not be waiting to address greenhouse gas emissions and global warming until faced with looming extinctions, the Endangered Species Act must be rigorously applied now that we have, unfortunately, already reached this point.

And while Section 7 of the Endangered Species Act is certainly not a complete solution to global warming, the law has an important role to play. As Justice Stevens wrote in Massachusetts v. EPA, 127 S. Ct. 1438 (2007), "Agencies, like legislatures, do not generally resolve massive problems in one fell swoop, but instead whittle away over time, refining their approach as circumstances change and they develop a more nuanced understanding of how best to proceed." Section 7 consultation will provide an important opportunity for agencies to analyze the cumulative impact of the greenhouse gas emissions of their actions on the polar bear, and to incorporate measures to reduce or eliminate those emissions.

Section 7 consultation is required for "any action [that] may affect listed species or critical habitat." 50 C.F.R. § 402.14. Agency "action" is defined in the ESA's implementing regulations to include "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: .... *actions directly or indirectly causing modifications to the land, water, or air.*" 50 C.F.R. § 402.02 (emphasis added).

This regulatory definition of "action" is sufficiently broad to encompass actions that result in greenhouse gas emissions, as it would be hard to argue that such emissions are not "causing modification to the land, water, or air." Many federal agency actions result in greenhouse gas emissions that are sufficiently large that they "may affect" the polar bear.

Because the goal of Section 7 consultation is to avoid jeopardizing any listed species, the regulatory definition of "jeopardy" offers some guidance as to how the consultation requirement for a greenhouse gas emitting action may be interpreted. To "jeopardize" a species means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce *appreciably* the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02 (emphasis added). If an action "appreciably" contributed to global warming, that action could then be found to jeopardize a listed species. "Appreciably" is defined in the Oxford English Dictionary as being "to the degree that can be estimated," while something is "appreciable" if it is "large or important enough to be noticed."[11] So if an action contributes an appreciable amount of greenhouse gas emissions to the atmosphere, that action should undergo the consultation process.

While many federal actions may not contribute appreciable amounts of greenhouse gases to the atmosphere, many clearly do so. For example, the corporate average fuel economy (CAFE) standards for sport utility vehicles and light trucks are set via regulation by the National Highway Transportation Safety Administration. Since the transportation sector represents a large component of United States greenhouse gas emissions, the volume of greenhouse gases represented by this single rulemaking are certainly "appreciable." Similarly, the Minerals Management Service approves offshore oil and gas leasing which will result in billions of barrels of oil, the lifecycle of the production and use of which is certainly "appreciable." The greenhouse gas emissions from numerous other actions, ranging from the approval of new coal-fired power plants, oil shale leasing programs, or limestone mines for cement manufacturing, and scores of other projects are individually and cumulatively having an appreciable effect on the atmosphere. These are all agency "actions" as defined by the ESA, which "may affect" listed species, and therefore trigger the consultation requirements of Section 7.

---

[11] Oxford English Dictionary online, http:www.askoxford.com/concise_oed/appreciable?view=uk.

The vast majority of federal agencies are not yet consulting on the impacts of greenhouse gas emissions and global warming on ESA-listed species. This may be changing, however. The Supervisor of the New Mexico Ecological Services Field Office of FWS, for example, recently requested additional information relating to the formal Section 7 consultation on the Desert Rock coal fired power plant proposed in New Mexico:

> The estimated annual carbon dioxide emissions [of the coal fired power plant] is 12.7 million tons....The recent summary of the United Nation's Intergovernmental Panel on Climate Change 4th assessment report calls the evidence of climate warming "unequivocal" and expresses over 90% confidence that most observed warming is due to human influence. Because this project directly and cumulatively contributes to increased concentrations of green house gases which have been identified as a principle driver of climate change, please provide an analysis of a) the potential effects of climate change on the hydrology and water resources of the San Juan River basin; specifically address in your analysis the results of modeling of future water availability; and b) the effects of any changes in hydrology and water resources of the San Juan River basin on Colorado pikeminnow, razorback sucker, bald eagle, and Southwest willow flycatcher.[12]

While Section 7 only applies to federal actions and agencies, the prohibitions of Section 9 apply far more broadly, reaching the actions of private entities and corporations. Section 9 prohibits the "take" of listed species, which includes "harming" and "harassing" members of the species in addition to simply killing them directly. Both the legislative history and case law support "the broadest possible" reading of "take." *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687, 704-05 (1995). Section 9 will clearly apply to direct impacts to polar bears and their habitat; it remains to be seen how and if Section 9 will be applied to greenhouse gas emissions.

In addition to the prohibitions of Sections 7 and 9, global warming will be implicated in virtually every other aspect related to the listing of the polar bear. Critical habitat will have to be designated for the species. Sea ice is obviously essential to the species' survival so such areas will ultimately have to be designated as critical habitat. The ESA also requires that a recovery plan for the polar bear be prepared and *implemented.* There is no hope for recovery, much less survival, of the polar bear absent substantial reductions in greenhouse gas emissions. Any legally adequate recovery plan must therefore include mandates to reduce such emissions.

---

[12] July 2, 2007 Memorandum to Regional Director, Navajo Regional Office, Bureau of Indian Affairs, Gallup, New Mexico from Supervisor, New Mexico Ecological Services Field Office, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

It is important to note that the protections of the Endangered Species Act are far broader than those provided by the Marine Mammal Protection Act ("MMPA"). The MMPA has no procedural requirement akin to Section 7 that requires agencies to affirmatively look at the impacts of their activities on marine mammals or to avoid jeopardy. The MMPA has no requirement to protect critical habitat. The MMPA has no requirement to develop a recovery plan for a species. Significantly, the MMPA does not have a citizen suit provision, so enforcement is left entirely to FWS. This is no academic matter as from March 2005 until August 2006 no operative MMPA take authorizations for oil and gas operations existed in the Beaufort Sea in Alaska but industry activities resulting in take of polar bears continued with no enforcement from FWS.

In sum the Endangered Species Act will provide broad protections to polar bears once they are listed, and will address both direct threats to polar bears and their habitat as well as the greenhouse gas emissions that cause global warming. The Endangered Species Act listing, however, while an essential first step towards saving the polar bear, will not on its own be sufficient save them. If "business as usual" emissions trends continue, the polar bear will be driven extinct irrespective of Endangered Species Act listing or any other management actions. Business as usual is simply no longer an option. If the polar bear is to have a future, we as a nation and as a global community must immediately begin implementing deep greenhouse gas emissions reductions as well as change our management paradigms to reflect the new realities presented by a warming Arctic. The remainder of this paper sets forth an action plan to do so.

IV. A Rapid Action Plan to Protect the Polar Bear

The situation in the Arctic has reached a critical threshold. But with immediate action it is still possible to slow the melting of the Arctic. In addition to broader local, national, and international efforts to reduce U.S. and global carbon dioxide (CO_2) emissions, saving the Arctic requires prompt reductions of other greenhouse gases, along with specific efforts to address direct threats to the region from industrial activities such as oil development and shipping. Reducing emissions of methane and black carbon, which both have short atmospheric lifetimes and a large warming impact on the Arctic, is a critical component of any effective action plan. Immediate methane and black carbon emissions reductions can buy the world a little more time to achieve the deep reductions in CO_2 emissions that are necessary to protect the far north. But the window of opportunity to act, like the ice, is shrinking rapidly.

A. Reducing Greenhouse Gas Pollutants Rapidly Enough to Address Arctic Melting

The essential first component of an action plan to save the polar bear is a mandatory reduction in carbon dioxide ("CO_2") pollution. Beginning CO_2 reductions immediately and eventually reducing them to a small fraction of current levels is essential to saving polar bears. But the Arctic has reached such a critical threshold that CO_2 reductions alone, even if undertaken rapidly, will almost certainly not be enough to sufficiently slow the Artic melting to save the polar bear. This is because CO_2, once emitted, tends to remain in the atmosphere for centuries, and therefore the benefits of reductions today will not be fully felt for some time.

Our window of opportunity to save polar bears relates to the fact that the warming impact of short-lived greenhouse pollutants including methane, tropospheric ozone, and black carbon (soot) is larger in the Arctic than it is globally. The non-CO_2 pollutants are responsible for at least half of the warming in the Arctic (Hansen et al. 2007), as opposed to about 30% globally (Forster and Ramaswamy 2007). Black carbon has a disproportionately large warming impact in the Arctic, and both black carbon and methane have much shorter atmospheric lifetimes than CO_2. This means that immediately reducing these pollutants can buy some desperately needed time and presents our best opportunity for slowing the Arctic melting before it is too late.

Fortunately, there are many feasible reduction measures available today for these pollutants, with literally hundreds of millions of metric tons of CO_2eq[13] "no-cost" reductions on the table, including many that could be undertaken at a net economic benefit. According to conservative projections by the U.S. EPA, about 500 $MtCO_2eq$ of global methane emissions reductions could be achieved globally by 2020 at a cost benefit or no cost (EPA 2006). Nearly 70 $MtCO_2eq$ of these available reductions are in the United States (EPA 2006). The EPA estimates total technically feasible methane reductions for 2020 at over 2400 $MtCO_2eq$ globally and nearly 280 $MtCO_2eq$ in the US, many of which can be achieved at low cost (EPA 2006).

Reductions in CO_2, methane and black carbon will have major public health benefits as well. Many of the measures necessary to reduce global warming pollution, including increasing energy efficiency, increasing the use of renewable energy and phasing out fossil fuels, and ultimately changing our land use, transportation, and consumption patterns, will improve our quality of life, improve our economy, and make the world a healthier, safer, and more equitable place. Congress should act immediately to explicitly cap and then rapidly reduce not only CO_2, but also the short-lived greenhouse pollutants. A detailed discussion of available reductions short-lived pollutants is given in our report *Not too Late to Save the Polar Bear — A Rapid Action Plan to Slow the Arctic Meltdown* (Center for Biological Diversity 2007).

B. A New Management Paradigm for a Warming Arctic

Greenhouse gas emissions must be rapidly reduced to a small fraction of current levels not only to save the polar bear, but to avoid the most catastrophic impacts of global warming for the rest of the world as well. But even under a rapid greenhouse gas reduction scenario, the Arctic will still undergo significant additional warming with the concomitant additional loss of sea ice. Approximately 0.6° C of additional warming is already in the pipeline due to the excess energy in the Earth's climate system from past greenhouse gas emissions (Hansen et al. 2005; Alley et al. 2007). As with the warming observed to date, the Arctic will continue to warm more rapidly than the global average. Substantial additional reduction of Arctic sea ice over the course of this century is therefore likely unavoidable. For the polar bear, things are going to get much worse before they begin to get better.

---

[13] For ease of comparison, the volume of each pollutant is expressed as its "carbon dioxide equivalent" in millions of metric tons. Thus, 1 million metric tons of methane is equivalent to 21 million metric tons of CO_2 equivalent ($MtCO_2eq$).

As grim as the outlook for the polar bear is, it is not hopeless. Unlike the terrestrial ice-sheets of Greenland, the melting of which may become irreversible on human-relevant timeframes, the Arctic sea ice, portions of which melt and reform every year, may be capable of relatively rapid recovery following climate stabilization. Assuming greenhouse emission targets can be met, the climate can be stabilized, and with subsequent reductions in atmospheric CO_2 levels, the Arctic sea ice can recover to levels supporting long-term viable populations of polar bears and other ice-dependant species. The key to polar bear persistence then, is weathering the very bumpy ride through the next half-century. To shepherd the polar bear through the ensuing decades, we must reduce all other stressors on the species and its habitat and tailor national and international management of the sensitive Arctic ecosystem to the new reality of a rapidly changing Arctic.

While the ongoing changes in the Arctic are now readily apparent, for the most part, U.S. federal agencies have utterly failed to incorporate this new reality into their decision-making affecting the Arctic. With the possible exception of the Department of Defense (*see, e.g.* ONR 2001), federal agencies are making planning decisions and issuing permits, authorizations and leases in and affecting the Arctic with a near-total disregard for the rapidly changing conditions in the region. This is leading to uninformed and unwise decision-making negatively affecting the polar bear and the entire Arctic ecosystem.

If U.S. agencies have been slow to recognize and respond to new conditions as the sea ice recedes, the rest of the world has been quick to claim the spoils of a warming Arctic. Russia, Norway and Denmark have all recently staked competing territorial claims to portions of the oil-rich Arctic seabed while Canada has asserted sovereignty over the increasingly ice-free Northwest Passage. Similarly, the specter of a seasonally ice-free Arctic carries with it the likelihood of greatly increased shipping in the region.

Many of these elements of a changing Arctic carry a double threat to the polar bear. Increased oil and gas development in the Arctic threatens not just to degrade important polar bear habitat, but will also lead to further fossil fuel commitments, making emissions reduction targets all the more difficult to reach. Increased shipping in the Arctic not only carries increased risks of oil spills and further disruptions of the polar bear's habitat, but also, perhaps more importantly, would lead to a substantial injection of additional black carbon directly where it would do the most damage to the Arctic climate. Finally, territorial disputes in the Arctic will lead to an increased military presence in the Arctic leading to disruption and pollution from vessels and aircraft as well as increasingly frequent polar bear/human interactions — encounters that the polar bears almost always lose.

If we are to respond to the warming Arctic in a manner compatible with the long-term survival of the polar bear, we must directly confront the changes taking place in the region. Federal agencies must incorporate the best available information about global warming and its impacts on the Arctic into all decisions directly or indirectly affecting the Arctic. We must also reduce direct impacts on polar bears and their habitat from shipping and industrial activities through such measures as a moratorium on the expansion of such activities in areas subject to

U.S. control. Finally, because protecting the polar bear and the Arctic is only possible with the cooperation of not only all Arctic nations, but with the global community more broadly, we should initiate and engage in proactive multilateral efforts to protect the Arctic and its resources so it remains largely unspoiled for future generations in a manner similar to what has been accomplished under the Antarctic Treaty. Each of these measures is described in more detail below. All are necessary if polar bears are to survive in the very different Arctic we have given them.

1. Incorporate Global Warming into Federal Agency Decisions

Congressional action and new laws explicitly capping and reducing CO_2 and non-CO_2 pollutants are clearly necessary if we are to slow and ultimately reverse global warming and save the Arctic and the polar bear. Nevertheless, existing law allows, and in some cases requires, the executive branch to take significant action to address the current and future impacts of global warming on vulnerable human landscapes, natural ecosystems, plants and wildlife. Use of this authority will benefit all imperiled species, including the polar bear. Unfortunately, such statutory mandates have largely been underutilized, ignored, or explicitly rejected by the current administration.

Existing laws governing federal agencies that relate to global warming and the Arctic fall into three broad categories: laws requiring the compilation and analysis of information relevant to decision-makers; laws requiring the contribution of a given agency decision or action to greenhouse gas emissions and global warming be analyzed and in some cases mitigated; and laws requiring the changing status of species and resources in a warming climate be properly considered in decision-making. Several laws address more than one of these categories. Examples of each, relevant to the polar bear, which the administration has ignored or underutilized are briefly discussed below.

Information-generating statutes:

The Global Change Research Act (GCRA) requires the administration to provide to Congress and agencies an assessment of the trends and effects of global climate change on the United States, to be updated every four years. 15 U.S.C. Sec. 2936(2)-(3). The last such assessment was prepared in 2000. The administration is under court order to prepare a new assessment by May 2008, as the result of a lawsuit brought by the Center for Biological Diversity, Friends of the Earth, and Greenpeace.

The Marine Mammal Protection Act (MMPA) requires regularly updated stock assessment reports for all marine mammals subject to U.S. jurisdiction. 16 U.S.C. § 1361 *et seq.* Updated stock assessments for polar bears and walrus are three years overdue. Stock assessments for ice-dependant seals relied upon by polar bears for food, while regularly updated, do not incorporate recent information on global warming and sea-ice declines.

Analysis of greenhouse gas emissions from federal actions:

The Outer Continental Shelf Lands Act (OCSLA) governs the leasing of tracts for offshore oil development in federal waters, including those areas of the Beaufort and Chukchi seas utilized by polar bears. In approving the 2007-2012 Program covering all offshore leasing in the U.S. the Secretary of Interior refused to quantify the greenhouse gas emissions from the oil and gas expected to be produced under the program and failed to monetize CO_2 and non-CO_2 pollutants in calculating the economic costs and benefits of the program.

The National Environmental Policy Act (NEPA) requires the preparation of an environmental impact statement analyzing all significant impacts of proposed federal actions. Few NEPA documents for significant greenhouse gas generating projects prepared to date analyze the impacts of such emissions. None that we are aware of analyze the impacts of greenhouse gas or black carbon emissions on Arctic warming or the polar bear.

The Endangered Species Act requires each federal agency to ensure through consultation with the FWS that any federal action does not jeopardize the continued existence of any listed species or destroy or adversely modify its critical habitat. 16 U.S.C. § 1536. To date, despite the fact that existing regulations require consultation on any action "directly or indirectly causing modifications to the land, water, or air," 50 C.F.R. § 402.02, most federal agencies are not consulting regarding the impacts of greenhouse gas emissions flowing from agency actions.

Analysis of the changing Arctic in federal decision-making:

Each of the statutes mentioned above require informed decision-making and the use of the best available science. Nevertheless, few if any agency decisions directly affecting the polar bear's Arctic habitat have properly taken into account the changing status of the species. Perhaps the best example is Chukchi Lease Sale 193. At the same time that one Interior Department agency, the FWS, has stated that it cannot yet determine which areas are "essential to the conservation" of the polar bear, another Interior Department agency, the MMS, proposes to lease over 46,000 square miles of the polar bear's habitat for oil and gas development. If the Interior Department doesn't have enough information to designate critical habitat for the polar bear, then it certainly doesn't have enough information to rush forward with the lease sale.

Another example is that in August 2006, the FWS issued regulations under the MMPA allowing unlimited take of polar bears from all oil and gas related activities in the Beaufort Sea region for a period of five years. Despite a request from the Marine Mammal Commission to consider the impacts of global warming in making the required determination of "negligible impact" under the statute, the Service issued the authorization assuming impacts would be similar to those documented when similar authorizations were issued more than a decade previously and prior to the substantial changes of sea ice and polar bear population size and distribution evidenced by recent scientific observations. *See* 71 Fed. Reg. 43926 (Aug. 2, 2006).

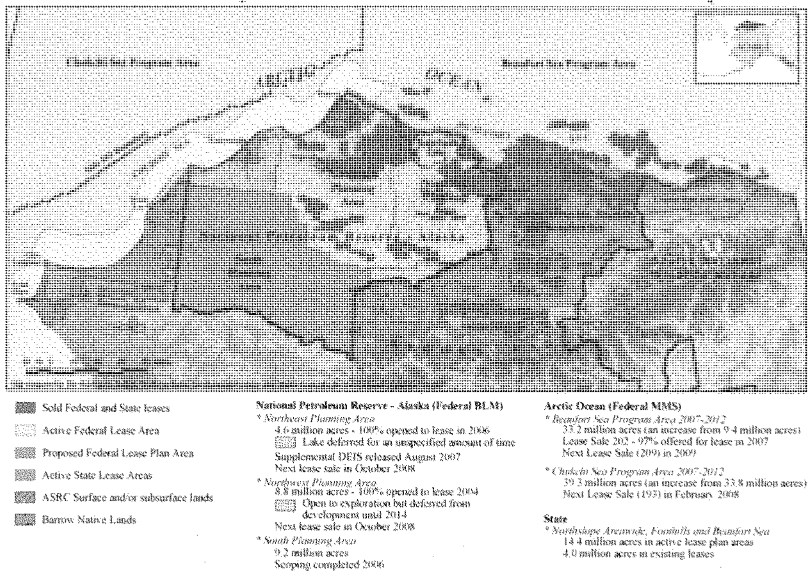
As the above examples demonstrate, management decisions directly affecting the polar bear have not caught up with the science demonstrating significant changes in the status of the species and its Arctic ecosystem. As uninformed decision-making is often unwise decision-making, the polar bear will continue to be harmed by federal agency actions until and unless all relevant agencies start incorporating the most recent information regarding global warming and its impacts on the Arctic into their decision-making. Climate-informed decision-making is already the law; now it needs to be translated into action.

2. Reduce Other Stressors on Polar Bears and the Arctic

While a business-as-usual warming scenario would doom the polar bear to extinction and render any other conservation efforts irrelevant, saving the polar bear will require not just dramatically changing greenhouse gas emission trajectories but also addressing other cumulative threats to the species. While climate-informed decision-making will probably be better decision-making, and will reduce cumulative impacts to the polar bear, certain activities, no matter how thoroughly vetted, should simply no longer be allowed in polar bear habitat. Among these are activities that directly add black carbon to the Arctic (e.g. shipping) and activities that directly disturb polar bears and degrade their essential habitats (e.g. oil and gas activities).

In 2003 the National Research Council noted that "[c]limate warming at predicted rates in the Beaufort Sea region is likely to have serious consequences for ringed seals and polar bears, and those effects will accumulate with the effects of oil and gas activities in the region." (NRC 2003). Since the NRC report, both the impacts of global warming on the polar bear and the cumulative impacts of oil and gas activities have greatly accelerated. With the lease sales in the Beaufort and Chukchi seas scheduled under the 2007-2012 Program, and the ongoing rapid leasing and development of the NPR-A, the vast majority of polar bear habitat subject to U.S. jurisdiction, whether at sea or on land, is now open for oil and gas leasing and development. *See* Figure 7 (Map of existing and proposed leases in the Beaufort and Chukchi seas).

Figure 7: Current and Proposed Oil and Gas Leases on Alaska's North Slope


ARCTIC OCEAN
▩ Sold Federal and State leases
▩ Active Federal Lease Area
▩ Proposed Federal Lease Plan Area
▩ Active State Lease Areas
▩ ASRC Surface and/or subsurface lands
▩ Barrow Native Lands
National Petroleum Reserve - Alaska (Federal BLM)
* Northeast Planning Area
4.6 million acres - 100% opened to lease in 2006
▩ Lake deferred for an unspecified amount of time
Supplemental DEIS released August 2007
Next lease sale in October 2008
* Northwest Planning Area
8.8 million acres - 100% opened to lease 2004
▩ Open to exploration but deferred from development until 2014
Next lease sale in October 2008
* South Planning Area
9.2 million acres
Scoping completed 2006
Arctic Ocean (Federal MMS)
* Beaufort Sea Program Area 2007-2012
33.2 million acres (an increase from 9.4 million acres)
Lease Sale 202 - 97% offered for lease in 2007
Next Lease Sale (209) in 2009
* Chukchi Sea Program Area 2007-2012
39.3 million acres (an increase from 33.8 million acres)
Next Lease Sale (193) in February 2008
State
* Northslope Areawide, Foothills and Beaufort Sea
14.4 million acres in active lease plan areas
4.0 million acres in existing leases

Polar bears in the Beaufort Sea and elsewhere are already undergoing food stress, and as a consequence resorting to cannibalism or simply starving (Amstrup et al. 2006; Regehr et al. 2006; Aars et al. 2006). Cub survival is down. (Regehr et al. 2006; Aars et al. 2006). Denning has shifted from occurring mostly on ice to mostly on land and numerous bears now congregate on land pending the fall freeze-up of the sea-ice (Regehr et al. 2006; Aars et al. 2006). At the same time, the Beaufort Sea coast is becoming increasingly industrialized. This combination is potentially devastating for the species. Denning bears with reduced fat stores from a shorter hunting season are both more vulnerable to disturbance from oil industry activities and increasingly dependant upon areas subject to such industrial development. Similarly, hungry bears, trapped on land, are more likely to wander into oil camps and facilities looking for food, where their odds of being directly killed by humans acting in self-defense or being exposed to oil and other chemicals increases dramatically.

In addition to direct impacts on polar bears, oil industry activity also impacts their prey, such as ice seals which may be exposed to seismic surveys, icebreakers and other disturbances which could either harm these animals or render them less available for bears to hunt. Oil industry activity also results in methane and black carbon emissions in the Arctic from production activities, and of course substantial CO_2 emissions from the ultimate combustion of the recovered oil and gas.

Given the rapidly changing Arctic, the precarious status of polar bears, and the numerous adverse impacts of oil and gas industry activities on the species, we believe that there should be a moratorium on new oil and gas leasing and development in the range of the polar bear. Such a polar bear based moratorium should be implemented immediately and remain in effect until and unless such activity can be demonstrated to not have adverse impacts on the polar bear, and any greenhouse emissions directly or indirectly associated with such activities are shown to be consistent with a comprehensive national plan to reduce CO_2 and non-CO_2 pollutants to levels determined necessary to sufficiently slow the loss of sea ice.

In addition to oil and gas activities, a growing cumulative threat to the polar bear is likely to be increased shipping in the Arctic which brings with it black carbon emissions, the risk of oil spills, and direct disruption and disturbance of polar bears and their prey. The U.S. should work in appropriate international fora such as the International Maritime Organization and the Arctic Council to prevent the establishment of new shipping routes in the Arctic. Simultaneously, the U.S. should require that any vessel transiting Arctic waters subject to U.S. jurisdiction utilize fuels and engine technologies that minimize black carbon emissions, and apply for and operate consistent with take authorizations under the MMPA and Endangered Species Act so as to minimize direct impacts to polar bears and their prey.

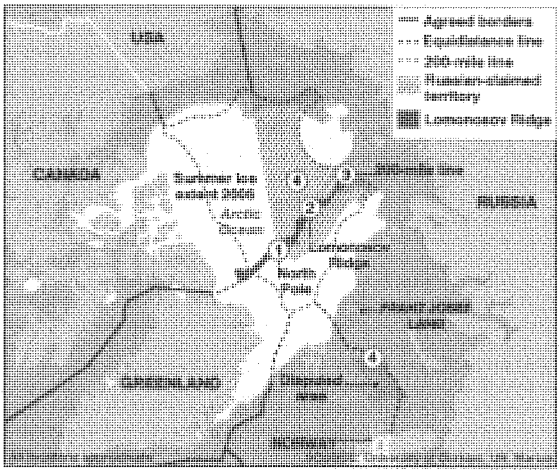
Finally, persistent organic pollutants (POPs) represent a significant threat to polar bears and other Arctic species. As polar bears operate in an increasingly food-stressed state, they are likely to metabolize body fat containing unhealthy concentrations of POPs. The impact of POPs on individual polar bears can have both lethal and sub-lethal effects. As polar bear populations decline, and individual bears become more vulnerable, the disruptive cumulative effects of POPs on the species are likely to grow. Reduction or elimination of these compounds, both through application of U.S. law and international effort will likely provide substantial benefit to polar bears.

While many of the cumulative threats to the polar bear are subject to direct regulation by the U.S. and can and must be addressed immediately, the ultimate survival and recovery of the polar bear will require international efforts, not just to reduce greenhouse gas emissions and stabilize the climate system, but to protect the fragile Arctic habitat upon which the polar bear depends.

3. Towards an International Protection Regime

Ultimately, the protection of the polar bear and its Arctic habitat is the shared responsibility of not only the U.S., or even the five Arctic nations with polar bear populations, but of the broader global community. As global warming transforms and increases human access to the Arctic, we must be as proactive as possible in protecting this area. Since much of the Arctic is beyond any country's control, and many portions are now contested by competing national claims, a key component of an Arctic protection strategy rests in the international arena (*See* Figure 8).

Figure 8: Arctic Territorial Claims



1) North Pole; 2) Lomonosov Ridge; 3) 200-nautical mile (370km) line; 4) Russian-claimed territory

Just as the Antarctic Treaty arose in the context of competing national claims to that continent, the territorial disputes that are shaping up in the Arctic as the sea ice recedes and commercial exploitation of the region becomes foreseeable, present not just a threat, but an opportunity. Given we are entering the International Polar Year, the time is right to push for international action to permanently protect the shared treasure of the Arctic. The U.S. should proactively promote the large-scale protection of the Arctic through all existing international mechanisms, including the International Agreement for the Conservation of Polar Bears, the Arctic Council, and the United Nations Commission on the Law of the Sea. The U.S. cannot remain a spectator as other nations compete to divide up the resources of a newly accessible Arctic. We need to become a participant, not to stake our own claims, but to lead efforts to render any such claims irrelevant, and protect the Arctic and the polar bear through the rapid changes of the coming decades.

V. Literature Cited

Aars, J., N.J. Lunn, and A.E. Derocher. 2006. *Polar Bears: Proceedings of the 14th Working Meeting of the IUCN/SSC Polar Bear Specialist Group, 20-24 June 2005, Seattle, Washington, USA,* at 44. IUCN, Gland, Switzerland and Cambridge, UK.

Alley et al. 2007. Summary for Policy Makers *In Climate Change 2007: the Physical Science Basis Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Available at http://www.ipcc.ch.

Amstrup, S.C., B.G. Marcot, and D.C. Douglas. 2007. Forecasting the Range-wide Status of Polar Bears at Selected Times in the 21st Century. U.S. Geological Survey, Reston, Virginia, USA.

Amstrup, S.C., I. Stirling, T.S. Smith, C. Perham, and G.W. Thiemann. 2006. Recent observations of intraspecific predation and cannibalism among polar bears in the southern Beaufort Sea. *Polar Biology* DOI 10.1007/s00300-006-0142-5.

Center for Biological Diversity. 2007. *Not too Late to Save the Polar Bear — A Rapid Action Plan to Slow the Arctic Meltdown.* Available at http://www.biologicaldiversity.org.

Derocher, A.E., N.J. Lunn, and I. Stirling. 2004. Polar bears in a warming climate. *Integrated Comparative Biology* 44:163-176.

DeWeaver, E. 2007. Uncertainty in climate model projections of Arctic sea ice decline: an evaluation relevant to polar bears. U.S. Geological Survey, Reston, Virginia, USA.

Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: Changes in Atmospheric Constituents and in Radiative Forcing. *In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

FWS 2007. Email from Richard Hannon, Acting Alaska Regional Director to Fish and Wildlife Service Staff dated March 2, 2007; Memo from Richard Hannon, Regional Director, Region 7 to Director, Re: Foreign Travel Clarification - Janet E. Hohn – Norway, dated February 27, 2007;

Memo from Richard Hannon, Regional Director, Region 7 to Director, Re: Foreign Travel Clarification – Craig Perham – Russia, dated February 26, 2007; Memo from Richard Hannon, Regional Director, Region 7 to Director, Re: Foreign Travel Clarification – Janet E. Hohn – Norway, dated February 26, 2007.

FWS 2006. Transcript of FTS-DOI-Fish &Wildlife December 27, 2006 Telephonic News Conference. Moderator: Shane Wolfe, 01:00 pm CT.

Greenwald, N. 2007. *Politicizing Extinction: The Bush Administration's Dangerous Approach to Endangered Wildlife.* Center for Biological Diversity, Tucson, AZ.

Hansen, J., M. Sato, P. Kharecha, G. Russell, D.W. Lea, and M. Siddall. 2007. Climate Change and Trace Gases. *Phil. Trans. R. Soc. A* (2007) 365, 1925–1954 doi:10.1098/rsta.2007.2052.

Hansen, J., and M. Sato. In prep. Global Warming: East-West Connections. Available at www.columbia.edu/~jeh1/East-West_070925.pdf.

Hansen, J., L. Nazarenko, R. Ruedy, M. Sato, J. Willis, A. Del Genio, D. Koch, A. Lacis, K. Lo, S. Menon, T. Novakov, J. Perlwitz, G. Russell, G.A. Schmidt, and N. Tausnev. 2005. Earth's Energy Imbalance: Confirmation and Implications. *Science* 308: 1431-1435.

Kay, J. 2008. Groups cite oil leases in U.S. delay on rating polar bear's status. San Francisco Chronicle. January 8, 2008. Available at http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/01/08/MN60UAQFJ.DTL

Lentfer, J.W. 1972. Polar bear – sea ice relationships. Pp. 165-171 *In: Bears: Their Biology and Management.* Morges, Switzerland.

Meehl, G.A., T.S. Stocker, W.D. Collins, P. Friedlingstein, A.T. Gaye, J.M. Gregory, A. Kitoh, R. Knutti, J.M. Murphy, A. Noda , S.C.B. Raper, I.G. Watterson, A.J. Weaver, Z. Zhao. 2007: Global Climate Projections. Climate Change 2007: The Physical Science Basis of Climate Change. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Monnett, C. and J.S. Gleason. 2006. Observations of mortality associated with extended open water swimming by polar bears in the Alaskan Beaufort Sea. Polar Biology 29(8):861-687.

Nakićenović, N., J. Alcamo, G. Davis, B. de Vries, J. Fenham, S. Gaffin, K. Gregory, A. Grübler, T.Y. Jung, T. Kram, E.L. La Rovere, L.Michaelis, S. Mori, T. Morita, W. Pepper, H. Pitcher, L. Price, K. Raihi, A. Roehrl, H-H. Rogner, A. Sankovski, M. Schlesigner, P. Shukla, S. Smith, R. Swart, S. van Rooijen, N. Victor, and Z. Dadi. 2000. *IPCC Special Report on Emissions Scenarios.* Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 599 pp. Available at http://www.ipcc.ch/.

National Research Council of the National Academies ("NRC"). 2003. *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope.* The National Academies Press, Washington, DC, USA. 288 pp.

National Snow and Ice Data Center (NSIDC). 2007a. Arctic Sea Ice News Fall 2007. http://www.nsidc.org/news/press/2007_seaiceminimum/20070810_index.html (last visited October 14, 2007).

National Snow and Ice Data Center (NSIDC). 2007b. Arctic Sea Ice Shatters All Previous Record Lows. http://www.nsidc.org/news/press/2007_seaiceminimum/20071001_pressrelease. html (last visited October 14, 2007).

Office of Inspector General, U.S. Department of Interior (OIG). 2007. Report of Investigation, Julie MacDonald, Deputy Assistant Secretary, Fish, Wildlife, and Parks. March 23, 2007.

Office of Naval Research (ONR). 2001. Naval Operations in an Ice-free Arctic. Symposium17-18 April 2001. Final Report.

Regehr et al. 2007. Effects of earlier sea ice breakup on survival and population size of polar bears in Western Hudson Bay. *Journal of Wildlife Management* 71(8):2673-2683.

Regehr et al. 2006. Polar bear populations status in the Southern Beaufort Sea. U.S. Geological Survey Open-File Report 2006-1337, 20 pp.

Rosenzweig, C., G. Casassa, D.J. Karoly, A. Imeson, C. Liu, A. Menzel, S. Rawlins, T.L. Root, B. Seguin, and P. Tryjanowski, 2007: Assessment of observed changes and responses in natural and managed systems. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 79-131.

Schliebe, S., et al. 2006. Range-wide status review of the Polar Bear (*Ursus maritimus*). U.S. Fish and Wildlife Service, Anchorage, Alaska. December 21, 2006.

Stirling, I., N.J. Lunn, and J. Iacozza. 1999. Long-term trends in the population ecology of polar bears in western Hudson Bay in relation to climatic change. *Arctic* 52:294-306.

Stirling, I. and A.E. Derocher. 1993. Possible impacts of climatic warming on polar bears. *Arctic* 46(3):240-245.

Stone, I.R. and A.E. Derocher. 2007. An incident of polar bear infanticide and cannibalism on Phippsøya, Svalbard. *Polar Record* 43 (2007): 171-173.

Stroeve, J. et al. 2008. Arctic sea ice extent plummets in 2007. *Eos* 89:13-20.

Stroeve, J., M. M. Holland, W. Meier, T. Scambos, and M. Serreze (2007), Arctic sea ice decline: Faster than forecast, *Geophys. Res. Lett.*, 34, L09501, doi:10.1029/2007GL029703.

Taylor, M., K. Suckling, J. Rachlinski. 2005. The effectiveness of the Endangered Species Act: a quantitative analysis. *Bioscience* 55(4): 360-367.

Union of Concerned Scientists. 2005a. *U.S. Fish & Wildlife Service Summary February 2005.* Union of Concerned Scientists and Public Employees for Environmental Responsibility. 2 pp. Available at http://www.ucsusa.org/global_environment/rsi/page.cfm?pageID=1601.

U.S. Environmental Protection Agency. 2006. Global Mitigation of Non-CO2 Greenhouse Gases. U.S. Environmental Protection Agency Report 430-R-06-005, Washington, DC.

VI. Curriculum Vitae

Kassie Siegel
Center for Biological Diversity
P.O. Box 549
Joshua Tree, CA 92252
(760) 366-2232 x. 302
ksiegel@biologicaldiversity.org

Kassie Siegel is Director of the Climate, Air, and Energy Program at the Center for Biological Diversity, a non-profit membership organization which combines conservation biology with litigation, policy advocacy, and an innovative strategic vision in working to secure a future for animals and plants hovering on the brink of extinction, for the wild areas they need to survive, and by extension for the physical, spiritual, and cultural welfare of generations to come.

Siegel is a graduate of the Boalt Hall School of Law at the University of California, and has worked for the Center for Biological Diversity since 1998. She develops and implements campaigns and strategies for the reduction of greenhouse gas pollution and the protection of wildlife threatened by global warming, and also litigates cases addressing global warming under federal and state law.

Siegel is the author of the Petition submitted by the Center for Biological Diversity in February 2005 seeking protection of the polar bear under the Endangered Species Act, and lead counsel of the lawsuit filed in December 2005 by the Center, Greenpeace and NRDC to compel the Bush Administration to respond to the Petition, which resulted in the January, 2007 proposal to list the polar bear as threatened under the Endangered Species Act. She has drafted similar petitions for other species threatened by global warming, such as twelve of the world's penguin species, including the Emperor penguin. Siegel is also a volunteer presenter for the Climate Project.

SELECTED PUBLICATIONS AND PRESENTATIONS

Cummings, B., and K. Siegel (in press). Biodiversity, Global Warming and the United States Endangered Species Act: The Role of Domestic Wildlife Law in Addressing Greenhouse Gas Emissions *In* Adjudicating Climate Control: Sub-National, National, and Supra-national Approaches (W. C. G. Burns and H.M. Osofsky, *eds*), Cambridge University Press.

Cummings, B., and K. Siegel. 2007. *Ursus maritimus*: Polar Bears on Thin Ice. *Natural Resources and Environment* 22, Number 2, Fall 2007:3-7.

Siegel, K. 'CEQA and Global Warming Matters' Private Enforcement of Environmental Law: Prosecuting and Defending Citizens' Suits, The Environmental Law Section of the State Bar of California, May 2007, Oakland, California.

Siegel, K., R. Fairbanks, and S. Sakashita 'Global Warming and Biodiversity,' 25th Annual Public Interest Environmental Law Conference, March 2007, Eugene, OR.

Siegel, K. 'Global Warming, Biodiversity, and the Endangered Species Act,' Environmental Law Conference at Yosemite, The Environmental Law Section of the State Bar of California, October 2006, Fish Camp, California.

Siegel, K. 'The No Surprises Litigation,' The Endangered Species Act Conference, CLE International
June 2004, Santa Barbara, CA.

BAR MEMBERSHIPS

- Active member of California Bar (No. 209497); admitted to practice before the California Supreme Court, the U.S. District Courts for the Northern, Southern, Central, and Eastern Districts of California, and the U.S. Court of Appeals for the Ninth Circuit.
- Inactive member of Alaska Bar (No. 0106044); admitted to practice before the Alaska Supreme Court.

EDUCATION

- J.D., Boalt Hall School of Law, University of California, May 2000.
- B.A., College of William and Mary, Williamsburg, Virginia, May 1995.

The CHAIRMAN. Thank you, Ms. Siegel, very much.

Our second witness, Deborah Williams, is the President of the Alaska Conservation Solutions. She has devoted 25 years to conservation and sustainable community issues in Alaska. And for her work Ms. Williams received a presidential appointment as Special Assistant to the Secretary of Interior for Alaska.

We thank you and whenever you are ready, please begin.

STATEMENT OF DEBORAH WILLIAMS

Ms. WILLIAMS. Mr. Chairman and members of the committee, polar bears are indeed on thin ice. Thank you so much for holding this critical hearing to help focus the Nation's attention on the very serious plight of our country's polar bears, whose survival is jeopardized by global warming and proposed offshore lease sales.

Polar bears are bellwethers for the Nation and the world. Their fate reflects our fate. The good news is that there is still time to act, but unquestionably the time to act is now.

There are three actions that we can and must take to protect polar bears. All of these actions will be beneficial to our Nation's future. First, as has been well described, we must postpone the Chukchi lease sale until adequate information regarding polar bears and other key species is available, and certainly we cannot hold this lease sale until polar bears are listed under the Endangered Species Act and their critical habitat designated.

Secondly, we must provide critically needed funding for polar bear research and management, especially for the Chukchi population.

And third, we must of course pass comprehensive legislation substantially reducing greenhouse gas emissions.

Next slide. Alaska has warmed at a rate four times faster than the rest of the world, as shown in that previous slide. There we go. As shown in red. And in fact the Arctic Ocean is the warmest ever recorded in some locations, 5 degrees centigrade above normal.

Next slide. Sea ice has reduced dramatically in Arctic water. Especially, committee members, you can see where the Chukchi Sea is. That is where the dramatic reduction has occurred. As Dr. Steven Amstrup has stated, our results have demonstrated that as the sea ice goes so goes the polar bear.

Next slide. As evidenced by cannibalism, and these are slides of the brutal bloody fingerprints of global warming as it relates to polar bears, as evidenced by cannibalism, starvation, drownings, decreased cub survival, small skull size and more, the evidence is compelling: Alaska polar bears are suffering from the effects of global warming right now. Given the above it doesn't make sense to add a substantial additional risk to the survival of polar bears from the Chukchi lease sale that is scheduled to take place in less than a month. Absolutely not, the sale must be postponed.

Next slide. The Chukchi is an amazing part of our national heritage and home to the Chukchi bearing population of polar bears. Overall, this extraordinary sea nourishes humans and a myriad of other very valuable species. This slide shows the vast extent of the proposed Chukchi lease sale, which is in red, and how it overlaps with the American managed population of the Chukchi polar bears.

Stunning. Almost all of the critical polar bear locational sites is covered by this Chukchi lease sale.

Now, three critical points. We do not know enough about the Chukchi Sea population of polar bears or the biology of the Chukchi Sea to make an informed decision about this sale. We simply do not know how many polar bears there are in the Chukchi Sea. We don't know where they are distributed. Every Federal agency admits one of the following; that a reliable population estimate for the Chukchi Sea currently does not exist, quote, unquote, that existing population estimates, quote, are to be considered of little value for management, unquote, and that the population, quote, is already declining. In addition, the polar bear's numerous valuable species of whales, walruses, seals, birds and fish exist in the Chukchi Sea.

But this is, next slide, what I think, and the next slide is one of the most important statements made by a Federal agency, and that is looking at the Chukchi area as a whole. The National Marine Fishery Service has said, quote, the information necessary to properly assess the biological effects of sale 193 is not available, closed quote. Congress would never make a decision with this little information. It is irresponsible. This kind of ignorance is not bliss to polar bears or the other denizens of the Chukchi, especially when this ignorance is serving as the basis for proceeding with a very risky lease sale.

Next slide. We do, however, know that there have been major impacts from oil development in Alaska. For example, there is an average of over 500 spills from the North Slope oil industry each year. And as the Exxon Valdez oil spill underscores, human error can cause massive devastating oil spill damage. Oil spills are particularly a serious problem for the Chukchi, as Dr. Amstrup stated repeatedly. Oil kills polar bears. And it is particularly impossible to clean up oil when it is in broken ice, and that is what the Chukchi has. This is a lethal combination for polar bears.

Next slide. As has been repeatedly stated, there is a 33 to 51 percent chance, or an average of 40 percent chance of an oil spill. So bottom line what does this mean? As you have stated, Mr. Chairman, even MMS says that, quote, due to the magnitude of potential mortality as a result of an oil spill sale 193 could result in significant adverse impact to polar bears. As Special Assistant, I supported several oil and gas lease sales, but I do not support leasing in Chukchi at this time. It is irresponsible. And, Mr. Chairman, there are better alternatives.

Next slide. That wind farm is a cotebu which borders the Chukchi Sea. We have tremendous renewable energy in this area.

Next slide. Before closing, I do want to emphasize the need for Congress to fund necessary research and management efforts for the protection of the Chukchi and our Nation's other population of polar bears. And of course the final comment is first and foremost in addition to these actions we must dramatically reduce our emissions.

Last statement, we are a compassionate country filled with innovation and renewable energy resources. We do not need to write a death sentence for polar bears from premature ill-advised offshore leasing and recklessly high emissions of greenhouse gases. We can do better. And for the sake of polar bears, ourselves, and future generations, we must.

[The prepared statement of Ms. Williams follows:]

Testimony of Deborah L. Williams
President, Alaska Conservation Solutions
House Select Committee on Energy Independence and Global Warming
"On Thin Ice: The Future of the Polar Bear"
Thursday, January 17, 2008

It is an honor to testify before the House Select Committee on Energy Independence and Global Warming about the status of polar bears in Alaska and critically related issues. Polar bears are, indeed, on thin ice. As described more fully below, global warming is eliminating polar bear habitat, while certain other actions, like the proposed Chukchi lease sale, represent unacceptable additional risks to the future of this nationally treasured species.

Polar bears are bellwethers for the nation and the world. Their fate reflects our fate, in the face of the greatest challenge confronting mankind: global warming. As Dr. Mark Serreze with the National Snow and Ice Data Center has stated, "the Arctic is screaming,"[i] and, unquestionably, polar bears are suffering as a result. There are actions that we as a nation can and must take to protect this species; and these actions are also necessary and beneficial for our nation's future.

In this testimony, after providing a summary of three needed actions and a brief personal background, I will:

1) discuss the impacts from global warming on our nation's polar bear populations and habitat;

2) highlight the unacceptable paucity of information that we have about the Chukchi Sea, especially regarding the Chukchi population of polar bears;

3) describe the impacts that oil activities on the North Slope have had on the Arctic environment;

4) discuss the impacts that future oil drilling could have on polar bears, polar bear habitat, and other Arctic species, with a focus on the proposed Chukchi lease sale;

5) examine what actions should be taken to protect polar bear populations; and

6) explore some of the positive broader implications of taking actions to protect polar bears.

Needed Actions – A Summary

This testimony supports the importance of taking the following actions to protect our nation's polar bears and their habitat:

A. Postpone the Chukchi Sea Lease Sale 193 planned for February 6, 2008 until adequate information regarding polar bears and other key species and analysis of cumulative impacts of global warming and oil activities including major spills is available.

B. Provide critically needed funding for polar bear research and management, especially for the Chukchi population.

C. Take legislative actions to reduce greenhouse gas emissions, including funding renewable energy research and demonstration projects, passing economy-wide cap and trade legislation, enacting a renewable electricity standard, and extending the production tax credits for renewable energy projects.

Personal Background

A resident of Alaska for thirty years, I currently serve as President of Alaska Conservation Solutions, located in Anchorage, Alaska. Founded in 2005, Alaska Conservation Solution (AkCS) exclusively addresses the impacts of and solutions to global warming.

In the past, I have had the privilege of working for the Department of Interior on two occasions, and have been extensively engaged in marine mammal, oil and gas, and public land issues. Upon graduating from Harvard Law School in 1978, I participated in the Department of Interior's Solicitor's Honors Program in Washington DC. After the completion of that program, I transferred to Alaska to represent the National Park Service and the Fish and Wildlife Service in the Department of Interior's Regional Solicitor's Office in Anchorage.

Subsequently, in 1995 I received a Presidential Appointment as the Special Assistant to the Secretary of Interior for Alaska. In this position, I managed the Secretary's office in Alaska, the only such office outside of Washington DC, and assisted the Secretary in overseeing the Department's extensive legislative mandates in the 49th state. Among my many responsibilities, I was actively engaged in oil and gas leasing issues, the Exxon Valdez oil spill (serving on the Exxon Valdez Trustee Council), subsistence matters, fish and wildlife management issues, and climate change. I also worked with the outstanding employees of the Department of Interior who study and manage polar bears.

In addition to my relevant employment with the Department of Interior (DOI), I practiced oil and gas law, having represented the State of Alaska in *State vs. Amerada Hess, et al.*, involving the substantial underpayment of royalties by North Slope producers.

With this testimony, I am speaking on behalf of both Alaska Conservation Solutions and the Alaska Wilderness League.[ii]

I. Global Warming has had Significant Impacts on Alaska's Polar Bear Habitat and Our Nation's Polar Bears

The facts are clear: Alaska and the Arctic have warmed considerably, and at a rate faster than the rest of the world. Sea ice has reduced dramatically in Arctic waters and sea ice is essential for the survival of the polar bear. Alaska polar bears literally are feeling the heat right now. This section expands on these facts.

A. Alaska and the Arctic Ocean Have Warmed Substantially. While the earth as a whole has warmed approximately 1°F in the last 50 years, Alaska has warmed approximately 4°F during this same time period, according to the National Assessment Synthesis Team. Between 1949 and 2006, Barrow Alaska, which borders the Arctic Ocean, has warmed on average 3.8°F, while winter temperatures have increased 6.1°F.[iii] For Kotzebue, adjacent to the Chukchi Sea, the temperature increases have been 3.2°F and 6.8°F respectively. Most recently, at the end of 2007, "the northwest coast (of Alaska) had the strongest positive temperature anomalies with average monthly temperatures more than 6°F above normal."[iv]

Recent University of Washington data shows the warmest surface temperatures in the Arctic Ocean ever recorded. In some locations, temperatures were 5°C above normal.[v] The ocean north of Alaska and Eastern Siberia experienced the greatest summer warming, generally 3.5°C warmer than historical averages and 1.5°C warmer than ever recorded.

B. There have been Dramatic Reductions in Sea Ice. According to the National Snow and Ice Data Center (NSIDC), the Arctic Ice Cap has shrunk approximately 10% per decade between 1979 and 2007, or 28,000 square miles per year.[vi] Much of that shrinkage has occurred off the coast of Alaska and Eastern Russia. In 2007, the decline of the Arctic Ice Cap shattered all records. The Arctic Ice Cap melted to 4.28 million square kilometers, 23% less than the previous minimum set in September 2005.The loss is equivalent to the area of California and Texas combined. This was also 39% smaller than the long term average between 1979 and 2000. Notably, an area the size of Florida melted away in just 6 days.

The statistics cited above are based on highly accurate satellite images. As NSIDC notes, however: "If ship and aircraft records from before the satellite era are taken into account, sea ice may have fallen by as much as 50 percent from the 1950's."[vii]

The Arctic Ice Cap has shrunk not only in size, but also in thickness. Using satellite data, the NSIDC found that while most of the Arctic sea ice in the 1980's was around 5 years old and 2-3 meters thick, the oldest ice that can be found now is only 2-3 years old and "much more of the Arctic is about 1 meter thick."[viii] This evidence is being confirmed by field results, which show a 50% thinning as compared to 2001. Because of losses in both thickness and surface area, the volume of ice in the Arctic ice cap in 2007 was approximately 50% less than in 2004.[ix] Ice that is 9 or more years old has "essentially disappeared."[x]

In a comprehensive, prospective study, United States Geological Survey (USGS) scientists predict a 40% decline in summer ice in the Beaufort Sea by 2050, as well as a 40% decline in Bering Sea winter ice.[xi] While in the 1980's sea ice receded 30 to 50 miles off the north coast of Alaska, the projections indicate a 300 to 500 mile retreat by 2050.

Recent modeling of the future of the Arctic Ice Cap supports the importance of taking meaningful action now to reduce greenhouse gas emissions. The modeling shows that if we continue to increase emissions of greenhouse gases, the Arctic Ice Cap, and the entire critical (essential) habitat that it fosters, could be eliminated as early as 2040. However, that same modeling shows that if we substantially reduce emissions, we can save the Arctic Ice Cap and even expect some recovery. In other words, according to Dr. Marika Holland with the National Center for Atmospheric Research (NCAR), their modeling "indicates that society can still minimize the impacts on Arctic ice."[xii]

C. Alaska Polar Bears Are Being Adversely Affected by Global Warming Now. The Arctic sea ice [Note: not only the pack ice is critical to the bears...] is essential habitat for polar bears. Polar bears rely on sea ice for their survival, including feeding, mating, and resting. As the

U.S. Fish and Wildlife Service[xiii] repeatedly states, polar bears "depend upon sea ice habitats for their key life functions."[xiv] Because there has been less sea ice, Alaskan polar bears have experienced drownings, dislocation, shifting denning, cannibalism, starvation, smaller skull size, and higher cub mortality (discussed in more detail in the following subsection I.C). Similar ice conditions and trends in the Western Hudson Bay population in Canada have resulted in a 22% population decline in 17 years.[xv]

The decreases in sea ice in the Arctic Ocean and Bering Sea jeopardize our nation's two populations of polar bears: the Southern Beaufort Sea population (which is shared with Canada) and the Chukchi-Bering Sea population (which is shared with Russia). Very simply, as a recent, authoritative study concludes: "Polar bears depend on sea ice[xvi] and our analysis shows evidence of an association between declining sea ice and reduced survival." [xvii] A series of USGS studies further demonstrate that this iconic national species is at risk of elimination from Alaska as a result of global warming.[xviii] Indeed, by mid-century the USGS analyses show the loss of all Alaska polar bears and the reduction of world-wide polar bears by two-thirds, due to diminished sea ice from global warming.

It is important to recognize that at most – truly, at most – there are only 3,500 polar bears within the jurisdiction of the United States and Alaska. This is, indeed, a very small number of animals.

Scientists have already witnessed and documented many adverse effects to polar bears from global warming and retreating sea ice. These impacts include a statistically significant decline in the survival rate for first year polar bear cubs in the Southern Beaufort Sea from 61 cubs per 100 adult females between 1967-1989 to 25 cubs per 100 adult females between 1990-2006.[xix]

Furthermore, skull measurements of both first year cubs and adult males were also statistically significantly smaller than in previous years.[xx]

And, there are now documented cases of polar bears dying from starvation.[xxi] As the Final Environmental Impact Statement (FEIS) for the Chukchi Lease sale states, "an unprecedented number of adult female polar bears have been found starved to death in recent years."[xxii]

Previously, between 1979 and 1991, when there was more ice, 87% of Alaska polar bears surveyed were found on sea ice. This percentage fell to 33% from 1992 to 2004.[xxiii] This, and increased storm intensity, have contributed to documented drownings.

Similarly, between 1985 and 1994, 62% of Alaska polar bears denned on ice. Between 1998 and 2004, only 37% denned on ice, the rest denned on land.[xxiv] This is a dramatic shift in denning habits.

In the last fifteen years, the population of Southern Beaufort Sea polar bears has been estimated to be as high as 2,500 bears, and then 1,800 bears. Recently, using the most rigorous surveying methodology to date, the population is believed to be only 1,526 bears.[xxv]

Alarmingly, accurate population counts for the Chukchi population are completely unavailable (see further discussion under section II).

Notes Dr. Andrew Derocher, head of the Polar Bear Specialist group, "Without stabilizing the climate by taking serious and urgent action on climate change, I don't see a future for polar bears at all."[xxvi] Similarly, as leading USGS polar bear researcher, Dr. Steven Amstrup has stated, "Our results have demonstrated that as the sea ice goes, so goes the polar bear."[xxvii] In essence, our generation has the ability to write a death sentence for the polar bear, or to take action to assure that the species survives.

Before completing this section, it is important to observe that other Alaska ice dependent species are also showing signs of global warming stress. As ice pulls away from the continental shelf there are observations of walrus mothers abandoning their calves. Also, in the summer of 2007, thousands of walruses hauled out on shore. Further out on the ice, the snow cavities for some ring seals and other ice seals are collapsing with warming temperatures, exposing their young to predation or freezing. The decline of ice seals will impact polar bear populations.

And importantly, global warming is having adverse impacts on coastal indigenous cultures, infrastructure, communities, subsistence activities, archeological resources, shorelines, birds, fish, and more.[xxviii] With respect to indigenous cultures, the Arctic Climate Impact Assessment (ACIA) states, "Climate change is occurring faster than people can adapt. [It] is strongly affecting people in many communities, in some cases threatening their cultural survival." The ACIA further notes:"...the Arctic is becoming an environment at risk... sea ice is less stable, unusual and highly variable weather patterns are occurring, vegetation cover is changing, and particular animals are no longer found in traditional hunting areas during specific seasons. Local landscapes, seascapes, and icescapes are becoming unfamiliar, making people feel like strangers in their own land."

Finally, the acidification of our oceans represents an additive, dire consequence associated with human emissions of carbon dioxide. Since the Industrial Revolution, humans have increased the acidity of our oceans by over 30% as we have augmented the amount of CO_2 in our atmosphere from approximately 270 ppm to 380 ppm. Scientists are just beginning to study the effects of current and projected acidification. Alaska's waters, and associated public lands and resources, will probably be the most negatively effected. For example, acidification dissolves food chain building blocks like the plankton known as pteropods, which are critical food sources for Alaska salmon fry and other species. Acidification also reduces the saturation of carbonate ions, which especially represents a very serious problem for deep water corals found offshore of many of Alaska's lands. The potential impact of ocean acidification on polar bears deserves attention.

II. There is an Unacceptable Paucity of Information about the Chukchi Sea, Especially Regarding the Chukchi Population of Polar Bears

A. The Chukchi Sea. The Chukchi Sea of the Arctic Ocean sits between Russia's East Siberian coast and the Northwestern coast of Alaska. Pacific waters enter the Chukchi through the Bering Strait. It is known for its extreme environment, and for major seasonal and annual changes in ocean climate. These changes include the annual formation and deformation of sea ice, which drives the biological productivity of the Chukchi Sea.[xxix] Alaska Native communities exist on the shore of the Chukchi Sea, relying heavily on the marine wildlife of the region for their subsistence, spiritual and cultural health.[xxx]

The Chukchi Sea, including the Oil and Gas Lease Sale 193 area, provides important habitat for a myriad of wildlife, including the Chukchi-Bering Sea population of polar bears (hereinafter referred to as the Chukchi population).

B. There is an Alarming Lack of Information about the Chukchi Sea Population of Polar Bears.

Overview. How many polar bears are there in the Chukchi Sea population? We don't know. What is their condition? We don't really know. Have any comprehensive surveys or distribution studies been completed in the last 10 years on this polar bear population? No. Do we have the factual basis to impose greater risks on this population from oil and gas development in a substantial portion of their range? Absolutely not.

This absence of information about the Chukchi population is truly disturbing and alarming. Congress and the American people should be deeply concerned.

Analysis. Authoritative documents from the US government repeatedly conclude that we do not have reliable population data for the Chukchi stock of polar bears and that any estimates are of little value for management. In the US Fish and Wildlife Service's (USFWS or the Service) Status Assessment, revised in August 2002, the USFWS concluded simply: "A reliable population estimate for the Chukchi/Bering seas population currently does not exist."[xxxi] As a result, the USFWS did not even calculate a minimum population estimate, noting "since a reliable estimate for the size of this stock is currently unavailable, a minimum population estimate (N_{min}) was not calculated." In the Fish and Wildlife Service's Range Wide Status Review, the USFWS similarly states that "estimates of the size of the population...have wide ranges...and are considered to be of little value for management."[xxxii]

In 2006 and in 2007, USFWS acknowledged, once again, the absence of a reliable population estimate for Chukchi polar bears. The Service stated, "Currently a reliable population estimate is not available for the Bering-Chukchi Sea [CS] polar bear stock."[xxxiii] And, the Service noted that existing population estimates "are to be considered to be of little value for management. Reliable estimates of population size based upon mark and recapture are not available for this region. The status of the CS population...is now thought to be uncertain or declining."

It "bears" repeating, using the Fish and Wildlife Service's own words, that existing estimates regarding the population size for Chukchi polar bears are "considered to be of little value for management" and that the status of this population is "uncertain or declining."

With candor, and reflecting the most recent information, the Minerals Management Service (MMS), in its 2007 FEIS on the Chukchi lease sale states, "Although no recent population estimate is available for the CBS (Chukchi-Bering Sea) population, all available data indicate that it is already in decline.[xxxiv]

The United States is a signatory to the International Agreement on the Conservation of Polar Bears.[xxxv] With respect to the Southern Beaufort Sea population of polar bears, the Polar Bear Specialist Group (PBSG) stated that: the population is 1,500, based on 2006 survey results; that the trend for this population is "declining;" and that the status is "reduced."[xxxvi] This is consistent with all of the data discussed in section I.C above.

However, with respect to the Chukchi population of polar bears, the PBSG states that the data is "deficient" to describe the status of these bears. More specifically, the PBSG states, "Abundance estimates with measurable levels of precision are not available.[xxxvii] Furthermore, the PBSG has concluded that "the subpopulation trend is believed to be declining and the status relative to historical levels is believed to be reduced..."

In short, in 2008 scientists know or believe that the populations of the Southern Beaufort Sea stock and the Chukchi stock are in decline, but with respect to the Chukchi stock our knowledge is appallingly limited.

None of the testimony above is meant to denigrate the Alaska office of the USFWS or the Alaska office of the USGS. These scientists and line managers are doing their best. They simply have not been provided with necessary funding and other resources to do their job for the benefit of polar bears or the American public. Congress needs to fund these necessary survey, monitoring, and management activities immediately.

C. We Know Very Little about the Other Species in the Chukchi Sea, or the Ecosystem as a Whole. In addition to polar bears, numerous whales species, walrus, seals, birds and fish exist in the Chukchi Sea. For example, bowhead whales, including mothers and calves, migrate through the Chukchi lease sale area.[xxxviii] Gray whales summer in the lease sale area, parts of which (e.g. the Hanna Shoal) contain important feeding habitat.[xxxix] Gray whale use of the Chukchi Sea is increasing, likely as a result of changing prey regimes due to climate change.[xl]

The Chukchi Sea provides the "main feeding grounds" for walrus, which are a "species of special concern."[xli] This is due to "the importance of offshore habitats within the Chukchi, the documented sensitivity of walruses to anthropogenic disturbances, and the significance of walrus hunting to the economy and culture of indigenous communities in Alaska and Chukotka."[xlii]

The sea is also home to the Stellar and spectacled eider, both of which are protected under the Endangered Species Act (ESA). A portion of the Chukchi Sea, Ledyard Bay, is so important to continued survival of the North Slope breeding population of spectacled eider – the majority of which molt in the bay each summer – that it has been designated as critical habitat under the ESA.[xliii]

At the same time, as expert and ocean management agencies admit, there is a void of basic biological information about the wildlife in the Chukchi Sea. For example, in reviewing MMS's Sale 193 plans, the National Marine Fisheries Service (NMFS) stated that "the information necessary to properly assess the biological effects of Sale 193 ... is not available."[xliv]
NMFS is an agency cooperating with MMS for purposes of MMS's Sale 193 compliance with the National Environmental Policy Act (NEPA)[xlv] and has particular expertise on the marine environment, and includes marine mammals and fisheries within its jurisdiction under various environmental laws.[xlvi]

The United States Environmental Protection Agency (EPA) is also a cooperating agency with MMS for Sale 193 NEPA compliance.[xlvii] In its input to MMS on Lease Sale 193, EPA also stated that there is a "lack of data" about the key biological and subsistence resources in the Chukchi Sea.[xlviii]

In its comments on Sale 193, the Fish and Wildlife Service also acknowledged the lack of fundamental information, and stated that "MMS should work cooperatively with the Service to initiate studies to determine the number, status, and distribution of polar bears and walruses in the Chukchi Sea."[xlix]

Finally, MMS itself acknowledges critical gaps in knowledge for many species that inhabit the Chukchi Sea. For example, MMS states that there is a "paucity of information available on marine mammal ecology in the Chukchi Sea….,"[l] including historical information about the "distribution and abundance" of marine mammals."[li]

MMS also notes that "current data are not available" on summer use of the Chukchi by bowhead whales, and that the data that does exist "should not be interpreted as indicating current patterns of bowhead use of the Chukchi Sea."[lii] With respect to beluga whales, which migrate through the Sale 193 area in the late summer and fall, MMS states that "[l]ate-summer distribution and fall-migration patterns are poorly known, … and areas that are particularly important for feeding have not been identified."[liii] Basic biological data about gray whales is also missing.[liv]

MMS also knows "[l]ittle … about the biology or population dynamics of ice seals …. Accurate population estimates for ice seals are not available and are not easily attainable due to their wide distribution and problems associated with research in remote, ice-covered waters."[lv]

Most data about marine and coastal birds are also quite old, including site-specific data on habitat-use patterns, routes, and timing.[lvi] This, as MMS admits, makes "accurate analysis difficult."[lvii]

Finally, there is very little information on fish in the Chukchi:

> Robust population estimates or trends for marine fishes of the region are unavailable. Distribution or abundance data for marine fish species are known only generally at the coarsest grain of resolution (for example, common, uncommon, rare) …Detailed information generally is lacking concerning the spread, density, or patchiness of their distribution in the overall Chukchi Sea region. Data concerning habitat-related densities; growth, reproduction, or survival rates within regional or local habitats; or productivity rates by habitat, essentially are unknown for fishes inhabiting waters seaward of the nearshore, brackish-water ecotone.[lviii]

III. There have been Substantial Cumulative Impacts from Oil and Gas Development in Arctic Alaska

There have been major cumulative impacts to wildlife, wildlife habitats, human cultures and the environment from oil and gas exploration and development across Alaska's North Slope. This has occurred from expanding industrial sprawl, thousands of spills, extensive industrial activities, and air pollution generated by the oil industry.

There are also special risks posed by offshore oil and gas exploration and development in the Arctic Ocean. During the Bush Administration there has been a massive increase in industrial oil and gas activities, including the Chukchi Sea in Lease Sale 193 planned for February 6, 2008.

A. A Profile of The North Slope Oil Industry. At present, the oil industry spreads across more than 1,000 square miles of the North Slope. It includes the following components:

- over 4,800 exploration and production wells;
- over 320 gravel pads for production, exploratory drilling, living quarters and other support facilities;
- over 500 miles of roads;
- over 1,800 miles of pipelines;
- 2 refineries;
- at least 20 airports;
- 36 gravel mines;
- 28 production plants, gas processing facilities, and water treatment and power plants.[lix]

B. There have been Thousands of Spills on the North Slope. According to the Alaska Department of Environmental Conservation, there is an average of over 500 spills of oil or other substances from the North Slope oil industry each year. Over 4,000 spills totaling 1.9 million gallons of toxic substances occurred during a nine-year period.[lx]

The largest crude oil spill in the North Slope oil fields in March 2006 released over 200,000 gallons on the tundra and was followed by another in August 2006 which resulted in a shutdown of most of the Prudhoe Bay oil fields. These spills exposed serious problems with corrosion and lack of adequate government and industry monitoring in the oil fields. In November, 2007, BP was ordered to pay $21 million in criminal penalties for violating the Clean Water Act, and will be on criminal probation for three years due to its negligence regarding the Prudhoe Bay pipeline maintenance. For eight years prior to the spill, BP had not pigged the pipeline where the major spill took place.[lxi]

C. The Exxon Valdez Oil Spill Underscores the Fact that Human Error Can Cause Massive Oil Spill Damage. The March 24, 1989 grounding of the Exxon Valdez spilled over 11 million gallons of Alaska North Slope crude oil into Alaska's Prince William Sound, becoming one of the most significant man-made environmental disasters in human history.

The resulting spill covered over 10,000 square miles of Alaska's coastal ocean, and oiled some 1,500 miles of some of the nation's most productive and ecologically sensitive shoreline - three national parks, four national wildlife refuges, a national forest, five state parks, four state critical habitat areas, one state game sanctuary, and many ancestral lands for Alaska Natives.[lxii] Americans were outraged and saddened by the Exxon Valdez spill. A study of the lost aesthetic and intrinsic values derived simply from knowing that the resources exist ("passive use") estimated the damage to Americans at $2.8 billion.[lxiii]

Exxon Valdez oil spill studies show petroleum hydrocarbons pose higher risks to fish and wildlife than previously known and that there is long-lasting ecological damage. Nearly 19 years later, the ecosystem still suffers and oil can still be found buried in beaches. Over a dozen species of fish and wildlife, designated wilderness, subsistence, commercial fishing, recreation and tourism, passive uses, and intertidal communities injured by the oil spill have not fully recovered.[lxiv]

Many scientific studies show the long-term chronic effects of the Exxon Valdez spill on the ecosystem.[lxv] Substantial contamination of mussel beds persists and the remarkably unweathered oil is a continuing source of toxic hydrocarbons.[lxvi] Sea otters, Barrow's goldeneyes, and harlequin ducks showed evidence of continued hydrocarbon exposure through 2002, and Pigeon Guillimots and Pacific herring populations still are not recovering as of 2007. [lxvii] Transient Orcas (killer whales) suffered an unprecedented decline since the spill,[lxviii] and the National Marine Fisheries Service formally listed a killer whale family group living in Prince William Sound and Kenai Fjords as depleted under the Marine Mammal Protection Act.[lxix]

Crude oil is more toxic than previously thought. Recent studies by the National Marine Fisheries Service show that even very low levels of weathered Exxon Valdez oil (0.5 to 1 part per billion PAH's) are toxic at the early life stages of salmon and herring and current Alaska water quality standards allow hydrocarbon levels that can impair reproduction to salmon eggs.[lxx]

The Exxon Valdez oil spill occurred 19 years ago and ExxonMobil still refuses to pay the $2.5 billion punitive damages ordered by the courts to fishermen and local residents harmed by the spill (its appeal is currently pending in the U.S. Supreme Court).[lxxi] On August 31, 2006, the State and Federal governments petitioned ExxonMobil for an additional $92 million, under the 'reopener' clause in their 1991 settlement in order to restore current and unexpected damage caused by lingering oil that was unexpected at the time of the settlement.[lxxii]

D. North Slope Oil Production Produces Extensive Air Pollution including Greenhouse Gas Emissions. The oil industry on the North Slope annually emits approximately 70,000 tons of nitrogen oxides, which contribute to smog and acid rain.[lxxiii] Nitrous oxides are also greenhouse gas pollutants. Other regulated pollutants include 1,470 tons of sulfur dioxide, 6,199 tons of particulate matter, 11,560 tons of carbon monoxide, and 2,647 tons of volatile organic compounds annually.[lxxiv] Prudhoe Bay air emissions have been detected nearly 200 miles away in Barrow, Alaska.[lxxv] According to the National Academy of Sciences, it is not clear that existing air quality standards are sufficient to protect arctic vegetation, and monitoring of such ecological effects is not taking place.[lxxvi]

North Slope oil facilities release other greenhouse gases, including 24,000 metric tons of methane, and 7 to 40 million metric tons of carbon dioxide, annually.[lxxvii] In January, 2008, the Alaska Department of Environmental Conservation (ADEC) reported that Alaska's oil and gas industry (primarily at Prudhoe Bay) is the single largest contributor of greenhouse gas emissions accounting for 29% of all statewide emissions (totaling 15.26 Million Metric Tons of CO_2 equivalents, for only CO_2, CH_4, and N_2O).[lxxviii] The oil industry is the single largest sector of

Title V (Clean Air Act stationary major source operating permits), comprising 73% of those emissions in Alaska. These are largely due to the largest concentration of natural gas turbines in the world existing at Prudhoe Bay which power oil field production.[lxxix] An earlier inventory also quantified 4.9 Million Metric Tons of CO2 equivalents released as methane from the extraction of fossil fuel resources from the earth.[lxxx] Methane, the main constituent of natural gas, enters the atmosphere from leaking pipelines, venting and flaring, and from drilling— and oil and gas development generally comprises the fourth largest methane source worldwide.[lxxxi]

E. Footprints Continue to Expand, Accidents Continue to Happen, and Impacts Continue to Accumulate. In order to assess whether new technologies and techniques will eliminate the problems discussed above, it is illustrative to examine the Alpine oil field – considered "the most advanced energy development on the North Slope."[lxxxii] The Alpine oil field lies in the floodplain of the Colville River Delta to the west of Prudhoe Bay and other North Slope oil fields. As ARCO (now ConocoPhillips) stated in the beginning planning stage for Alpine, "we'll develop Alpine from just two drill sites of less than 115 acre;" it will have the "smallest footprint ever."[lxxxiii]

The original Alpine development site consisted of two drilling pads, a runway for jet airplanes, three miles of in-field roads and other facilities that directly cover 100 acres of tundra.[lxxxiv] It also included 3-miles of in-field gathering pipeline,[lxxxv] 34-miles of common carrier pipeline from Alpine to the Kuparuk oil field,[lxxxvi] and a 150-acre gravel mine.[lxxxvii] The area in the Delta impacted by this development, based on a four-kilometer zone of influence around such developments,[lxxxviii] is over 80 square miles. This area calculation does not take into account the land impacted by the over 30 miles of pipeline to the east of the Colville Delta.

For Alpine, during construction in June and July 2001, as many as 1,980 flight take-offs and landings in 45 days during the migratory bird nesting season[lxxxix] compared with the 13 round trips per month presented in 1997 project descriptions and impact analyses.[xc] The noise associated with such constant heavy aircraft use has negative impacts on the subsistence hunting success of local residents.[xci]

And Alpine is not without its accidents. During Alpine's construction, the field operator lost 2.3 million gallons of drilling muds while tunneling under the Colville River. ARCO stated that this huge, unanticipated, loss of this lubricant did not harm the environment. Yet, ARCO "didn't do anything" to determine if the drilling muds filtered up from beneath the river and actually seeped into the river itself,[xcii] and neither did government regulators.

Gas flaring episodes at the Alpine oil field lasting longer than one hour exceeded quantities released in such upsets at all the other North Slope oil fields combined in 2000.[xciii] Alpine is located only 7 miles from the village of Nuiqsut. Adverse human health effects from chronic exposure to air pollution caused by repeated flaring discharges have been observed for people living or working near flaring in Canada and from offshore development near Los Angeles,[xciv] and have been reported in Nuiqsut.[xcv] According to a Canadian study, adverse impacts may occur at distances ranging from 0.2 – 35 km from the flaring.[xcvi]

In permitting Alpine to proceed, federal regulators and others dismissed future major expansion as "speculative," "conjectural," and "not reasonably foreseeable."[xcvii] This view of Alpine was supported by then-Senator Frank Murkowski as well:

> You can see that is a whole oilfield. That is it... You know there is one thing you see and you see a little airstrip and that is all. There is no road out of there. There is a[n] ice road in the wintertime, but in the summertime you have to fly to get in and out of there. . . . That is the technology we have. So it is an entirely different set of circumstances. To suggest that somehow this would be an expanse covering hundreds of miles, with airports and so forth, is totally inaccurate...[xcviii]

Less than two years after Senator Murkowski made this statement, ConocoPhillips, which took over the Alpine field from ARCO in 2000, received approval for five more drill sites at Alpine, bringing the Alpine field to seven drill sites, 33 miles of permanent gravel roads, two airstrips, two gravel mines, and 72 miles of pipeline.[xcix]

The community of Nuiqsut complained to BLM that the "industry touted roadless development as the way of the future, and is now abandoning the concept."[c] In response, BLM stated that the "'roadless' concept... has not been abandoned... 'Roadless' development never meant no roads only that the construction of permanent roads would be minimized."[ci]

Residents from Nuiqsut, the community adjacent to the Alpine field have stated the following about that development:

> Development has increased the smog and haze in our air and sky, affecting our health as well as the beauty of our land, sea, and air.[cii]
>
> How many wells are out there pumping away already? How many blowoffs, the flares, do we have to watch every year? They say they're only going to be there 30 days out of the year. But that's what they say for these statements. In actuality, we see it. You can count the flares from here...What is put out from those flares comes back to us. We have to see it. Our air has changed. The health of our people has changed. We have a lot more health problems than years ago... Day after day I have to see asthma patients.... Let's see how many of our young children are going to be sick, having trouble breathing, when we've got 12 flares blowing all at once...Rosemary Ahtuangaruak, Health Aide, Nuiqsut, 1998.[ciii]
>
> The cumulative impacts of all the developments leading to the surrounding or "boxing in" of the community by oil and gas development on all sides is devastating to the hopes and aspirations of our community members... Prudhoe Bay oil development has caused Nuiqsut residents to cease virtually all subsistence activities to the east of the community.[civ]

Medical experts, hampered by the lack of federal assessments of the impact of North Slope oil and gas activities on the health of local people, have made the following observations:

a) Local oil development produces large amounts of pollutants such as HAP;
b) Some pollutants commonly produced by oil and gas development activities bioaccumulate in fish and game animals exposed to them;
c) Fish and game in the vicinity of oil and gas exploration and development facilities may be exposed to these pollutants through air, water, or foraging on local plants;
d) The North Slope villages consume extraordinarily high quantities of locally harvested fish and game; and
e) North Slope villages have had a marked increase in cancer and asthma over the last 30 years, and now have among the highest rates in Alaska and the U.S. North Slope villages have also experienced marked increases in pulmonary diseases, and now experience nearly twice the mortality rate from pulmonary disease as the general U.S. population.[cv]

In short, the Alpine field, like all other fields on the North Slope, no matter the technology employed, results in environmental degradation.

F. Offshore Impacts from Past and Current Developments. The oil industry often points to offshore developments such as Endicott and Northstar located immediately north of Prudhoe Bay as examples of "new technology" with limited environmental impact. An examination of some of the significant problems that have taken place there is warranted.

Endicott Oil Field. BP and its drilling contractor, Doyon Drilling, paid $25 million in criminal fines and civil penalties for deliberate and chronic re-injection of hazardous drilling wastes down oil wells at the Endicott field over a three-year period between 1992 and 1995. Workers were instructed to violate environmental regulations and inject hazardous waste oil and solvents into unsealed outer well shafts.[cvi] For violating its operating permit, BP was placed on criminal probation for five years.[cvii] An employee of Doyon Drilling brought the problem to light in 1995 – the same year that Doyon's General Manager testified to the Senate Energy Committee that along with safety, "environmental protection is an equally critical part of [North Slope] daily operations... improvements in drilling and production technology can support orderly future Arctic oil development in a safe and environmentally sound manner."[cviii]

Northstar Offshore field Clean Air Act fines. Since it began producing oil, the Northstar field operated much of the time under compliance orders that has allowed it to operate in violation of the standards of the state of Alaska's Clean Air Act permit conditions. This has resulted in higher emissions of carbon monoxide, nitrogen oxides, and other air pollutants.

This first true offshore oil development in the Alaskan Beaufort Sea began oil production in October 2001.[cix] By the end of its first year of production, BP was fined by ADEC $75,000 in penalties and damages for operating in violation of its air quality permit pertaining to release of carbon monoxide emissions, exceeding daily flaring limits, and operating equipment that had not been permitted. ADEC allowed it to operate in violation of its permit conditions under a Compliance Order by Consent until February 15, 2003, whereupon ADEC issued another compliance order and another $75,000 fine.[cx] As of April 2005, BP still operated under ADEC's 2003 compliance order and reported emissions and flaring levels that exceed permitted levels.[cxi]

Significant impacts from seismic exploration and drilling to bowhead whales have been reported. The National Research Council (NRC) concluded, "Bowhead whale migrations have been displaced by the intense noise of offshore seismic exploration and exploratory drilling. Though limited development offshore has taken place to date, full scale industrial development offshore would displace polar bears and ringed seals from their habitats, increase mortality, and decrease their reproductive success."[cxii] According to Inupiat subsistence hunters in Barrow, "pods of migrating bowhead whales are displaced from their normal migratory path by as much as 30 miles" and one study found that once a seismic boat stopped operations at 65 miles away, bowhead whale calling rates increased, but little monitoring has been done at distances far from rigs or surveys.[cxiii] Sound from seismic exploration can be detected out to 100 nautical miles.[cxiv]

Spills. Even though there was poor reporting of spills during the peak of Outer Continental Shelf (OCS) exploratory drilling the 1980, there is evidence of spills. Furthermore, there have been substantial spills of petroleum products in the Beaufort Sea from industry activities and from barging (an activity required for offshore drilling and other activities).

- 77 offshore spills were reported in just two years during offshore drilling, ice road transportation, and other exploratory and development activities (1989-1990).[cxv]

- A 200-gallon crude oil spill from a flow line took place at the Endicott oil field on July 1, 2001.[cxvi]

- A spill near the offshore drilling platform for ARCO's Stinson well off the coast of the Arctic Refuge caused a sheen on the water that appeared to be coming from either under the ice or from oil in the melting ice, but neither the nature nor amount spilled was recorded.[cxvii]

- A barge tanker struck an iceberg near the western boundary of the Arctic Refuge enroute to Kaktovik and lost 68,000 gallons of fuel oil; no response was mounted despite oily sheen on the water near the coast and the presence of migrating birds.[cxviii] While it is unclear whether this barge supported industrial or village fuel needs, it points to the risks of barge tankers.

- In 1982, an exploratory drilling hydrocarbon spill into the Beaufort Sea was reported as 5-gallons, yet biologists found surface oiling and "bathtub rings" circling two barrier islands.[cxix]

Most exploratory wells drilled from artificial islands, drillships, ice islands, or other structures in the Beaufort Sea have dumped drilling muds and cuttings directly into the coastal waters. As recently as the winter of 2003, drilling wastes were dumped directly into the Beaufort Sea for the McCovey well drilled by a consortium including ConocoPhillips.[cxx] In 1997, drill muds and cuttings for ARCO's Warthog exploratory well were dumped into the Beaufort Sea into a productive boulder patch area located just three-miles offshore from the Arctic National Wildlife Refuge.[cxxi]

A study of shallow arctic marine sediments found barium, chromium, lead and zinc at elevated levels two to four years after exploratory drilling wastes were discharged into low energy environments of coastal lagoons in the Beaufort Sea.[cxxii] Although the Northstar offshore production island re-injects drilling wastes, there are still spills, such as 18,000 gallons of drilling muds that escaped containment in January 2001, according to the ADEC (2005).

The oil industry resisted "zero discharge" requirements – the best available technology – during EPA consideration of past National Pollution Discharge Elimination System general permits for the Beaufort and Chukchi Seas so that wastes still may be dumped into water deeper than 5 meters.[cxxiii] The cost of transporting drilling wastes for re-injection from exploratory wells or production sites even further offshore or drilled in remote parts of the North Slope may be a factor in future proposed practices.

The Wall Street Journal and *Financial Times* disclosed that the EPA had initiated a criminal investigation into intentional dumping of drilling wastes contaminated with hazardous material from an ice pad into the Beaufort Sea. Supervisors ordered that thousands of gallons of toxic drilling mud at the Ooogurük exploratory well be dumped into the sensitive coastal waters near Prudhoe Bay to save costs of proper disposal in March 2003, according to workers.[cxxiv]

G. Past Impacts on Polar Bears from Oil Development and Other Development on the North Slope. Indeed, "spilled oil can have dramatic and lethal effects on marine mammals, as has been shown in numerous studies, and a large oil spill could have major effects on polar bears and seals, their main prey."[cxxv] [cxxvi] Unfortunately, it is well known that polar bears are especially vulnerable to oil spills for at least three reasons. Polar bears groom their fur when it is fouled; polar bears and oil concentrate and accumulate in leads and openings that occur during winter as well as spring breakup and autumn freeze-up periods (Amstrup, Durner and McDonald, 2000; Durner et al., 2004); and bears are attracted to petroleum products and consume foods fouled with oil (Derocher and Stirling, 1991).

How do polar bears die from oil? They die from acute inflammation of their nasal passages, renal impairment, anemia, anorexia, stress, skin damage hair loss, and serious thermoregulatory problems (Oritsland et al.,1981, a lethal study involving oiled polar bears).

Their natural curiosity and keen sense of smell often place polar bears in harm's way from oil development activities, such as being attracted to drill rigs, garbage dumps, and contaminants. In 1990, a bear that approached an offshore rig in Camden Bay off the Arctic National Wildlife Refuge was killed. The oil industry reported over 250 encounters between polar bears and their operations along the coast over a seven-year period with over 100 of these involving conflicts.[cxxvii] In many cases, polar bears were harassed and chased away from oil operations with cracker shells and rubber bullets, herded with trucks, snowmachines, helicopters, and sirens.

Even relatively small spills, involving substances such as ethylene glycol, can have serious effects on polar bears. In 1988, a mother polar bear died from a mixture of ethylene glycol and Rhodamine B dye. Though the exact source of the antifreeze was unknown, such chemicals were commonly used to mark runways and ice roads on the North Slope. After this bear's fluorescent pink carcass was found, a hazard notice issued in 1988 said, "use of non-toxic propylene glycol rather than the toxic ethylene glycol might have saved the lives of these bears."[cxxviii] Yet, ADEC records show that since 1996 there have been 187 spills (16,693 gallons total) of *ethylene* glycol compared to 21 spills (1051 gallons total) of *propylene* glycol, indicating that use of the poisonous substance is still prevalent. Six ethylene glycol spills were larger than 1,000 gallons and one also contained crude oil. There were also two large spills in 1995, including one of 5,700 gallons at Prudhoe Bay Gathering Center 1, the site of another large spill in 2001.

As the oil industry has grown on the North Slope, its footprint has continued to expand into polar bear habitats. The Agreement on the Conservation of Polar Bears committed the US and the other four arctic nations to "protect the ecosystems of which polar bears are a part, with special attention to habitat components such as denning and feeding sites and migration patterns." Polar bears are especially sensitive to disturbance during denning.[cxxix] Females may abandon their dens if disturbed, and early den abandonment can be fatal to cubs unable to fend for themselves.

There is simply no question that oil spills are lethal to polar bears. In an experimental study in Canada, polar bears died from the toxic effects of ingesting oil after grooming, and high levels of absorbed hydrocarbons were stored in blood, brains, and other tissues.[cxxx]

IV. The Potential for Oil Spills and Other Problems Associated with Offshore Oil and Gas Activities is Great.

Offshore Oil and gas exploration and development involve myriad activities.

For example, according to MMS assumptions, oil development resulting from Chukchi Sea Lease Sale 193 will result in up to 174 exploratory, production and service wells; up to 200 miles of offshore pipelines; 300 miles of onshore pipeline to reach the Trans-Alaska Pipeline; onshore shorebase; processing center; and a landfill.[cxxxi] Based on the Alpine field example discussed above, and other examples, this is likely an underestimate. Nevertheless, even given this modest scenario, the projected impacts from the Chukchi lease sale would be very significant, especially with respect to a major oil spill.

Similarly, Shell has proposed a multi-year Beaufort Sea exploration that involves a flotilla of 16 marine vessels, including two huge drill rigs, tugs, icebreakers, and supply ships, as well as aircraft.[cxxxii] Exploration in the Chukchi would be similar. Lease-related activity also involves areas outside of the lease boundaries themselves. MMS predicts that support vessels for seismic surveys will make two trips per week through the coastal zone to refuel. In addition, there will be regular air traffic over the coastal zone, as well as significant coastal infrastructure, including pipelines connecting an offshore platform to a new shore base.[cxxxiii]

More broadly, existing North Slope oil development, though primarily onshore, provides an example of the intensity of oil development activities.

A. There is a Substantial Risk of a Major Oil Spill from Oil Leasing in the Chukchi Sea. In its own public documents, MMS estimates a 40% chance of a large crude oil spill (26% for pipeline spill, 19% for platform spill) from development associated with Chukchi Lease Sale 193. That's right: 40%. The chance of one or more large spills would be 27-54% at the 95% confidence interval.[cxxxiv] MMS also estimates 179 small crude oil spills totaling 1,214 barrels (50,988 gallons).[cxxxv]

Depending on the site of the hypothetical spill from offshore platforms or pipelines, MMS's own oil spill resource analysis showed spill risks as high as:[cxxxvi]

- 34% chance Kasegaluk Lagoon could be oiled
- 50% chance of land being oiled
- 51% chance of large oil spill contacting Cape Thompson bird colonies during open water period
- 58% chance of large oil spill contacting Cape Lisburne murre breeding colony (within the Ann Stevens Unit of the Alaska Maritime National Wildlife Refuge).
- 56% chance Peard Bay a special area north of Wainwright could be oiled
- 58% chance that an area within Hannah Shoal could be oiled (this is Pacific Walrus and Gray Whale feeding habitat, although MMS's analysis fails to note this)
- 68% chance that the Chukchi Polynya from Icy Cape to Barrow (part of the spring Bowhead Whale migration route though MMS does not note this) could be oiled
- 72% chance Ledyard Bay Spectacled Eider Critical Habitat Area could be oiled[cxxxvii]
- 60% chance of oiling in the Wainwright Subsistence area

When the cumulative risks of North Slope and offshore oil developments are considered, the Corps of Engineers has projected a 95% chance of a major spill. Since pipelines contribute 97% of all oil spilled from Outer Continental Shelf operations, according to the MMS, concerns about integrity of the subsea oil pipelines are well justified.

B. There are Many Potential Sources for an Oil Spill Notably, in its analysis, MMS has overlooked many key sources of potential major spills which could significantly harm polar bears and other wildlife. Their spill analysis failed to assess the potential effects of a well blowout, or from other large potential spills such as from barge or tankers used to refuel drill ships, bottom-founded rigs, etc. or to transport oil.

The North Slope Borough has noted that a crude oil spill from exploratory drilling could be 6,930,000 gallons and a fuel oil spill as large as 10,000,000 gallons could result from an accident with the fuel tanker that Shell Oil Inc. plans to bring to the Beaufort Sea for its exploratory drilling operation.[cxxxviii] This spill potential from these two types of spills is far greater than MMS assumed in its Chukchi Sea analysis.[cxxxix]

MMS also failed to assess the impacts of a crude oil tanker spill; tankers may be needed for both well flow testing and potentially for transportation. In November, 2007, MMS presented different transportation scenarios in Barrow including oil tankering from production sites far out into the Chukchi Sea, and long sub-sea pipelines to landfall near Wainwright or Point Lay, with tanker port at Kivalina for shipment south. Yet nowhere in the Chukchi Sea EIS did MMS address these risks.

MMS acknowledged that "Arctic warming could change the feasibility of marine transportation through the Arctic," yet excused its lack of tanker analysis by saying that the "most practical way to transport oil from the Chukchi Sea OCS would be by pipeline across NPR-A and then through the established TAPS and tanker route."[cxl]

Furthermore, the cumulative effects of potential increased trans-shipment through the Chukchi Sea from Russia and through the Northwest Passage from Canada need to be considered as such activities are likely to occur during the same time frame as potential Chukchi Sea oil production from this lease sale.[cxli] The Chair of the Arctic Marine Shipping Assessment gave a presentation last year showing potential shipping routes possibly by 2025 from the Russian arctic over the North Pole to the Chukchi Sea as well as the possibility of increased ice breakers, LNG tankers, etc.[cxlii]

MMS also failed to conduct a cumulative impacts analysis of the impacts of oil spills from the combined Beaufort and Chukchi Sea lease sales, exploration, and development to critical wildlife species and their habitats, including polar bears, bowhead whales, Spectacled and Steller's eiders, and availability and access to subsistence resources by Alaska Natives.

C. There is No Proven Ability to Clean up Oil in Broken Sea Ice and Remote Open Waters like those of the Chukchi Sea. The National Academy of Sciences has determined that "No current cleanup methods remove more than a small fraction of oil spilled in marine waters, especially in the presence of broken ice."[cxliii]

The oil industry has failed spill exercises required for approval by the offshore Northstar oil field development oil spill response plans. The ADEC found BP had violated state oil response plan requirements for the Northstar field because it was unable to effectively mobilize booms, deploy skimmers and other equipment and was ill-prepared to even test equipment during drills conducted in 1999 and 2000. [cxliv] Full field test drills with all mechanical equipment are rarely done in Beaufort Sea and have not been done in the Chukchi Sea. Further analysis of the lack of spill response and clean up measures for broken ice conditions has been provided based on experience in Russia's Sakhalin Island as well as throughout the Arctic.[cxlv]

Recent offshore and marine spills show the reality of poor spill response and cleanup 19 years after the Exxon Valdez disaster. Just last month, a significant spill, estimated at about one quarter of the Exxon Valdez's 11 million gallons, occurred off of the coast of South Korea. The newspaper report stated:

> Thousands of fishermen, soldiers and volunteers struggled to clean up an oil spill that has caused an environmental disaster in South Korea. It has blackened once scenic beaches, coated birds and oysters in sludge and driven away tourists with its stomach-churning stench.But the 7,000 people mobilized were too few to clean up the oil slick, which has been washing up since Saturday along a 12-mile-long shoreline of the nation's west coast. Strong tides, which dragged the sludge before pushing it ashore again, hampered the cleanup operations by villagers, who complained of headaches and nausea from the stench...The spill came a week after the South Korean port town of Yosu won the right to be the host in 2012 for an international event called Expo. Bidding for the event, South Korea championed the theme of the living ocean and coast, a slogan it hoped would bolster environmental awareness in Asia.

> "Everyone is out there fighting....there is so much oil we have to use buckets to scoop it up," Moon Hong-chol, a resident in the village of Wonbuk in Taean, said by telephone. "The dark brown slime is all over our oyster and abalone and clam beds. Tourists are canceling resort reservations. I think we are finished." The provincial government appealed to people to donate used clothes for soldiers who were collecting the sludge in the freezing cold. ..."The oil stuck to the shore or sank to the sea bottom, causing serious damage to the maritime biology and ecosystem in the region," Mr. Kang said. "Even if some maritime organisms survive, they won't be marketable for quite a while."
>
> Coast guard vessels hurried to establish floating oil fences, but high waves left them useless. "All day, people have been scrubbing boulders coated with oil and scooping up sand soaked with oil," said Lee Hyun-jin, a resident in the village of Sowon in Taean. "But now they are retreating because the sea is in high tide again. We feel hopelessly outnumbered."
>
> "This is getting worse, and we have 260 villagers out there today with buckets, cans and whatnot, compared with 57 yesterday," Ms. Kim added. [cxlvi]

Less than a week later 25,000 barrels of oil spilled at an oil field in the North Sea. As admitted by the oil company involved, the weather prevented it from even deploying spill clean up equipment: "Four vessels are on the way out with skimming equipment but unfortunately because of the weather we cannot collect the oil right now," StatoilHydro's spokesman Kai Nielsen said. "There is too much wind, too high waves."[cxlvii]

V. Future, Extensive New Oil Drilling Such as the Proposed Chukchi Lease Sale 193, Could Have Significant Adverse Impacts on Polar Bears, Polar Bear Habitat, and Other Arctic Species

A. Summary. As discussed in the previous section, oil development in Alaska and elsewhere in the world has resulted in numerous oil spills and other adverse environmental impacts. Accidents happen; mistakes happen; infrastructure ages; and species suffer. Oil spills are lethal to polar bears. As MMS estimates a 40% chance of a significant oil spill associated with the Chukchi lease sale, yet remarkably still plans to proceed with the lease sale. We know that numerous other activities associated with oil development have the potential to harm polar bears. Therefore, it is reasonable to conclude that the Chukchi Lease sale, in particular, represents a substantial threat to polar bears, especially given our lack of knowledge about the numbers and behaviors of these bears. It also represents a substantial threat to other species and subsistence hunting and fishing.

B. Analysis. In General, MMS has inadequate information to accurately determine effects of oil development in the Chukchi Sea. One of the most fundamental points to understand about the likely impacts of oil and gas activities on polar bears and other Arctic wildlife, especially in the Chukchi Sea lease sale area, is the astounding lack of data about the fundamental biology of the Chukchi, how it is impacted by global warming, and, importantly, how it is likely to be impacted by oil and gas activities. These are not the well-charted waters of the Gulf of Mexico, where environmental research and oil activity have occurred for decades. It is a remote and wild sea about which little is known except, perhaps, for a common understanding that it's largely sea ice-driven biology is going through drastic changes due to global warming.

MMS specifically acknowledges this problem:

> Unfortunately, it has not been possible to predict the type and magnitude of marine mammal responses to the variety of disturbances caused by oil and gas operations and industrial developments in the Arctic. More importantly, it has not been possible to evaluate the potential effects on populations.[cxlviii]
>
> [W]ithout historical data on distribution and abundance, it is not possible to measure the impacts of an oil spill on marine mammals. Population-monitoring studies for key species need to be implemented in areas where significant industrial activities are likely to occur, so that it will be possible to compare future impacts with historical patterns and thus determine the magnitude of any potential effects.[cxlix]

Indeed, with respect to the ecosystem as a whole, MMS admits that: "Based on the paucity of information available on marine mammal ecology in the Chukchi Sea and on specific locations of future developments, we are unable to determine at this time if significant impacts will or will not occur."[cl]

With respect to walruses, MMS admits that "without current population estimates, it will be very difficult to evaluate the impacts of development on the Pacific walrus population."[cli] MMS is required to conduct adequate baseline studies (pre-leasing) and post-lease monitoring studies to determine impacts under OCSLA (43 U.S.C. 1332, 1336 20(b),1346(b).[clii] Clearly, these required studies have not been done for Pacific Walrus.

Unacceptably, MMS is currently scheduled to proceed with the lease sale before spill response and cleanup technologies have been proven or baseline studies have been done, thus creating the very situation that it knows makes impacts certain and so hard to gauge in advance.

C. Nevertheless, There is Sufficient Information to Understand that there will be Dramatic, Adverse Effects from Oil Development on Polar Bears and Other Species. The U.S. Fish and Wildlife Service has stated the following regarding oil spill effects:

> "Due to the lack of effective techniques for containing, recovering and cleaning up oil spills in Arctic Marine environments, particularly during poor weather and broken ice conditions, a large spill could have significant impacts on a variety of Service trust resources. Although the extent of impacts would depend on the size, location and timing of spills relative to seasonal concentrations of fish and wildlife and on the effectiveness of spill response and clean-up efforts, under some scenarios, population-level impacts to some species could be expected."[cliii]

In terms of polar bears, MMS itself has stated that "due to the magnitude of potential mortality as a result of an oil spill, [Sale 193] could result in significant adverse impacts to polar bears."[cliv]

This admission is in the context of MMS's framework statement that "impacts to polar bears are an increasing concern due to ongoing changes in their sea-ice habitat, their distribution, and the uncertain status of their populations."[clv] And, "Impacts to polar bears from oil and waste-product spills as a result of industrial activities in the Chukchi Sea are a major concern." [clvi] Once again, it is critical to remember that according to MMS, "for the Proposed Action, the chance of one or more large spills occurring, based on OSRA analysis, is 40%."[clvii]

Thus, as MMS concludes, "the impact of a large spill, particularly during the broken-ice period, could be significant to the polar bear population (65 FR 16833)."[clviii] "And, as discussed above, everyone knows, including MMS, "there are difficulties in effective oil-spill response in broken-ice conditions." [clix] It simply has never been accomplished, in tests or otherwise. Similarly, MMS concedes, "some OCS operations might pose a relatively high spill risk to polar bear aggregations and, there, to the polar bear population as a whole."[clx]

And the threats are cumulative. The analysis above focuses primarily on the Chukchi Sea, but those threats are in addition to the risks of an oil spill in the Beaufort Sea. As the National Research Council has stated: "A major Beaufort Sea oil spill would have major effects on polar bears and ringed seals."[clxi] The Council's study concluded that The effects of a major oil spill in coastal or marine waters could be devastating to migrating bowhead whales, waterfowl flocks in lagoons, ringed seals, polar bears, sensitive coastal wetlands, and protected area shorelines due to the difficulty of cleaning up crude.

Previous analyses show that as many as 60 to 108 polar bears could die in the event of a major spill from the offshore Liberty or Northstar fields, respectively, according to models that integrated oil spill trajectories and bear densities. An oil spill modeling study of the offshore Northstar development project estimated .4 to 78 bears would be oiled during the open water season and 0.1 to 108 potentially oiled during October's broken ice season with an average of 21 were predicted to be bears oiled, and therefore killed.[clxii] A second study for the proposed Liberty offshore development estimated 0-61 bears could be oiled and die.[clxiii] The models may have understated risks as they only tracked spills for 4 to 10 day periods, only looked at one oil field at a time, did not evaluate worse-case spill size, and did not model cumulative effects of many offshore developments. Similar detailed trajectory analyses of impacts to bowhead whales, Pacific walrus or polar bears in the Chukchi Sea have not been done.

For those few polar bears that do not die immediately, or that are subject to smaller concentrations of oil, they "would be very susceptible to the effects of bioaccumulation of contaminant associated with spilled oil, which would affect the bears' reproduction, survival, and immune systems ...and suppress the recovery of polar bear populations due to reduced fitness of surviving animals."[clxiv]

Oil spills, of course, can occur suddenly or can occur slowly. As MMS observes: "We note that 200,000 gal of oil...spilled onto the tundra as a result of an undetected leak in a corroded pipeline in March 2006....As vividly demonstrated by these events, small, chronic leaks in underwater pipelines could result in large volumes of oil being released underwater and under the ice cover without detection. The effects of a large oil spill, particularly during the broken-ice period, could pose significant risks to the polar bear population."[clxv]

In addition to oil spills, oil development has other prospective adverse impacts on polar bears. MMS also acknowledges that some potential impacts (i.e. from seismic activities in open water), "have not been studied…."[clxvi] While MMS claims that such impacts are likely to be minimal, it does concede that for bears which are energetically stressed, avoiding seismic activity "could prove fatal." [clxvii]

MMS also admits that developments along the Alaskan arctic coast "undoubtedly will increase the number of polar bear – human conflicts that occur" and that "even with the best mitigation measures in place, it is certain that some bears will be harassed or killed as a result of industrial activities in their habitat."[clxviii]

The State of Alaska, through its Department of Fish and Game explains the likely impacts of oil and gas activities on polar bears as follows: "Human activities, especially those associated with oil and gas exploration and extraction, pose the greatest immediate threat. Oil exploration and drilling activities in denning areas could cause bears to den in less suitable areas. Oil spills from offshore drilling and transportation of oil through ice covered waters could contaminate bears and reduce the insulating value of their fur, or adversely affect animals in the food chain below them. Severe environmental conditions would hinder or prevent containment of a spill, and currents and ice movement could distribute oil over large areas."[clxix]

These likely impacts, potentially significant in their own right, are exacerbated by stresses to polar bears from global warming. As noted previously, just four months ago, the USGS provided USFWS with nine reports concerning polar bears. These reports prompted USFWS to reopen the public comment period to allow the public to comment on the new analyses contained in these reports and their implications for the USFWS polar bear listing determination.[clxx] These reports depict a dire future for polar bear populations, including the polar bears that inhabit the Chukchi Sea.[clxxi]

For example, the reports indicate that nutritional limitations caused by the diminished extent of consolidated sea ice, greater duration of the open water period, and the increased distance between polar bears' sea ice hunting grounds and terrestrial denning areas have and will increasingly result in declining physical condition and reduced cub survival.[clxxii] The reports single out Wrangel Island as a denning area that will be especially distant from the retreating summer sea ice, causing females from the Chukchi Sea population, which utilize the island for denning, to suffer increased energetic stress.[clxxiii] Continuing the theme of lack of fundamental biological information on the Chukchi, these reports also note that the polar bear findings with respect to the Southern Beaufort Sea polar bear population provide useful insight into the fate of other, less studied populations that inhabit the same eco-region, such as the Chukchi Sea population.[clxxiv]

Essentially all other Arctic wildlife is vulnerable to adverse impacts from oil and gas activities, especially oil spills. The World Wildlife Fund recently published a report on whales in the Bering Sea and adjacent waters such as the Chukchi.[clxxv] Referencing myriad scientific reports, the WWF report notes that the threats posed to whales by offshore oil activities include physical harm and behavioral impacts from seismic surveys, the drilling of wells, construction associated with oil and gas activities, vessel and aircraft traffic, and accidents such as oil spills.[clxxvi]

With respect to walrus, their increasing use of Alaska coastal haulouts, and their inability to use traditional feeding grounds along the summer ice-pack, leave them increasingly vulnerable to disturbance from oil and gas activity such as that which can flow from Sale 193. A recent USFWS report detailed walrus use of new habitat in the Chukchi Sea this past summer as the sea-ice retreated from the continental shelf.[clxxvii] As explained in that report, walrus are normally associated with drifting pack ice in the offshore environment during summer months. Because sea ice retreated over water too deep to allow walrus to reach the sea bottom to feed during the summer of 2007, thousands of walrus hauled out on the Alaskan coast of the Chukchi Sea starting in late July.[clxxviii]

A USFWS walrus expert noted that the haulouts occurred a month earlier than usual and were "raising a bunch of conservation issues for us," including disturbance of the hauled out walruses from human activity,[clxxix] such as a low-flying airplane.[clxxx] This concern is well-founded, as evidenced by recent tragic events where 3,000 to 4,000 walrus died in stampedes while hauled out on the Russian coast of the Bering Sea. Notably, they were hauled out on shore due to low sea ice conditions in the Chukchi Sea.[clxxxi] As noted above, oil and gas activities are substantially more intensive than low-flying aircraft. Indeed, MMS itself states that "[o]il and gas activities that occur during ice minimum conditions in summer in the Chukchi Sea are likely to come into direct contact with adult females and subadult walruses."[clxxxii]

Finally, subsistence activities by local communities could also be adversely impacted by oil and gas activities. For example, "seismic noise and associated vessel movements could affect whaling, sealing, bird hunting, and fishing in the open-water season. Access to subsistence resources, subsistence hunting, and the use of subsistence resources also could be affected by reductions in subsistence resources and changes in the distribution patterns of subsistence resources."[clxxxiii]

EPA itself raised significant environmental justice concerns with Sale 193:

> EPA's primary concerns with the treatment of environmental justice during the Lease Sale 193 NEPA process and in discussions in the Draft EIS focus on the effects of multiple, overlapping and fast-tracked planning processes that have occurred over the past several months, and increasing concerns from local residents regarding human health impacts from proposed oil and gas exploration, development and production activities in the area.
>
> The public review and comment periods have at times occurred during critical whaling and other subsistence activity seasons when many of the key individuals in the communities were likely unavailable, and they have all occurred in such rapid succession that thoughtful and meaningful reviews, which the agencies ask for and expect, have undoubtedly been constrained. More importantly, it is understandable that the pressure to review, comment on and ultimately live with the rapid pace of industrial activities creates stress and other adverse impacts to individuals living in the area.
>
> [Another] concern relative to environmental justice results from EPA's review of the Draft EIS and also from our understanding of the recurring comments from local

residents and North Slope Borough officials about recognized and potential human health impacts from onshore and offshore oil and gas activities on the North Slope.[clxxxiv]

Given the weight of this evidence, it is no surprise that MMS itself has acknowledged that:

- Significant impacts could occur to belugas and walruses in the event of a large oil spill.[clxxxv]
- A large spill could impact common and thick-billed murres in late summer and early fall, when juveniles and attendant males are floating throughout the Chukchi Sea. During this period, juveniles have not yet developed the ability to fly and attendant males are flightless for several weeks while molting. This inability to move quickly out of the area coupled with the potential for affecting large numbers of birds could sharply decrease murre abundance at the Cape Thompson and Cape Lisburne colonies [Alaska Maritime National Wildlife Refuge].[clxxxvi]
- Because walruses are long-lived animals at the top of the food chain, and thus, subject to the upward biomagnifications of contaminants, the effects from contaminants on the Pacific walrus population from a large oil spill are likely to persist for decades.[clxxxvii]
- The effects of a large spill on subsistence are expected to be significant in the Chukchi Sea Sale 193 Proposed Action area.... There has been little experience with under-ice or broken ice oil spills, and local residents have little confidence in industry's current capability to successfully clean them up... Large spills could affect subsistence patterns by reducing populations of subsistence species, contaminating subsistence species or their habitats, or rendering resources unfit to eat.[clxxxviii]

To minimize potential impacts MMS relies in part on a Sale 193 coastal area setback buffer zone. Yet, there is simply too little known about the Chukchi Sea, the wildlife that inhabits it, and the effects of oil and gas activities on that wildlife to rely on the coastal buffer MMS proposes to mitigate impacts. As NMFS stated, "MMS's view and analysis supporting [the] setback, did not present a strong enough case to NMFS that marine resources would be adequately protected."[clxxxix]

VI. Actions That Should be Taken to Protect Polar Bear Populations. To protect our nation's polar bear populations, three categories of actions need to be taken:

1) cease major disruptive and risky activities until we have essential information about polar bears, their habitats and cumulative effects of global warming and oil industry activities particularly the Chukchi Lease Sale 193;

2) provide necessary funding to determine the population size of the Chukchi stock and monitor it, as well as provide the necessary funding to implement the Bi-lateral Polar Bear Agreement with Russia; and

3) reduce greenhouse gas emissions quickly and significantly.

A. Cease Major Disruptive and Risky Activities, Particularly the Chukchi Lease Sale, Until We Have Essential Information About Polar Bears. As numerous experts have stated, the Interior Department does not have sufficient information about the wildlife and other natural resources of the Chukchi Sea, the impact of global warming on those resources, or what the additional impact of oil and gas activities would be on such resources. This lack of information pointedly involves polar bears, though it is by no means limited to polar bears. It also includes other Arctic wildlife and the Inupiat culture and the subsistence way of life.

Based on these concerns NMFS recommended that MMS remove the Chukchi Sea entirely from its proposed 5-year plan due to this critical lack of science:

> The NMFS Alaska Region believes the proposed leasing schedule is unrealistically ambitious and would not allow for necessary environmental research . . . *This is particularly true for the* North Aleutian Basin (Bristol Bay) and *Chukchi Sea* proposed sales. *The NMFS Alaska Region recommends deletion of these areas* and initiation of a comprehensive research program to support future plans subsequent to the 2007-2012 plan . . . For instance, *MMS states repeatedly that little is known about the distribution, abundance, behavior, and habitat use of marine mammals in the Chukchi Sea, and the few existing studies are very dated. It is extremely important to gain a better understanding of these issues prior to any exploration, leasing, or development. The need for baseline data on the distribution of marine mammals in the Chukchi Sea is particularly urgent.*[cxc]

MMS disregarded NMFS's recommendation to withdraw the Chukchi Sea from the plan, simply stating, without elaboration, that it "disagreed" with NMFS's views.[cxci]

In its comments on Sale 193, NMFS continued to raise concerns about MMS's lack of scientific understanding of the potential impacts of Sale 193 on polar bears, whales, walrus, sea lions and other wildlife, as well as on Native cultures and traditional ways of life from drilling in the Chukchi Sea:

> We remain very concerned about potential impacts to living marine resources and their habitats, fisheries, and subsistence uses of marine resources as a result of lease sales, exploration, and development in the Chukchi Sea Planning Area. The individual and cumulative effects of development in these relatively pristine environments could be significant . . . [Yet MMS's] data to describe marine mammals within the sale area and their habitat use are lacking or inadequate . . . Some of these [scientific data] gaps are striking given the ecological, social and cultural importance of the marine mammals in question.[cxcii]

EPA was also critical of including the Chukchi Sea in the Five Year Program:

> [W]e have come concerns relating to the EIS's analysis of potential impacts and possible mitigation measures in leasing areas that were previously excluded from leasing in the 2002-2007 Lease Program and the cumulative impacts analysis. In the Chukchi Sea program area, the preferred alternative includes an area that was previously excluded

> from leasing in the 2002-2007 Lease Program due to the area's biological, cultural and subsistence resource values. ...EPA has rated this EIS EC-2 (Environmental Concerns/Insufficient Information). EPA's review has identified concerns with potential mitigation to impacts of developing previously excluded areas and cumulative impacts issues.[cxciii]

In its Sale 193 comments, EPA repeated its EC-2 rating and recommended that:

> MMS reconsider the proposed schedule for the lease sale, the accompanying NEPA process requirements, and the myriad of other overlapping resource development planning processes that are currently underway in the area and strive to achieve more balance in the both the planning schedules and in the impacts to residents' daily lives.[cxciv]

MMS also disregarded these expert recommendations, as evidenced by its intent to proceed with the lease sale.

One of the most important things that can happen for the polar bear is that Sale 193 not go forward. It is simply contrary to the best interests of our nation for MMS to hold Sale 193. Common sense and scientifically-supported prerequisites to holding a Chukchi Sea lease sale would include a final decision on whether to list polar bears under the Endangered Species Act and to designate critical habitat for polar bears. Assuming, as an objective look at the science seemingly would compel, that the USFWS lists the bear and designates critical habitat, the full ESA protections must proactively be applied to any proposed Chukchi Sea lease sale.

More fundamentally, before holding a Chukchi Sea lease sale the Interior Department needs significantly more basic baseline information on the Chukchi Sea, impacts from global warming, and the likely impacts on local communities from oil and gas development. Without gathering and analyzing such information, the Interior Department would unacceptably risk significant environmental and human harm if it held the lease sale.

To the extent that MMS says that it can lease now and take care of the problems later, is simply incorrect. First of all, once leases are let, flexibility as to geography is lost. The leases are tied to specific areas within the Sale 193 boundaries. If information gathered after the lease sale identifies biologically important areas, the federal government has lost significant discretion to react in a precautionary manner toward that information. Meaning that, as the process proceeds the opportunity for comprehensive review is no longer allowed. As courts have noted, the government cannot engage in comprehensive review of leasing "if the object of the review is a single exploratory plan or a single development and production plan." The government does not review a plan of operation and then determine that an adjacent tract should not be leased. "Thus the importance of the lease sale is not the physical activities lessees will be able to conduct without further approvals. The importance of the sale is directly linked to the comprehensiveness of the review and planning that can occur."[cxcv]
Furthermore, the existence of leases increases the practical momentum toward oil and gas activities. This means that later regulatory approvals are more likely to be granted than denied.[cxcvi]

For example, the Bristol Bay lease sale and ultimate buy back demonstrates the difficulty in returning to a pre-lease status quo. Below is a summary of that buyback's long history. Note that it included significant activity in all three branches of government over many years. In contrast, one person at the Interior Department today can make the decision not to hold Sale 193.

In 1986 MMS held Lease Sale 92, offering over 5.6 million acres in the North Aleutian Sale #92 (Bristol Bay). Twenty three lease blocks were sold for a price of more than $95,000,000.[cxcvii] After the Exxon Valdez Oil Spill Congress included annual moratoria in the Interior Appropriations bill, the federal government was prohibited from any leasing activity in OCS waters in Bristol Bay. As well, Bristol Bay was included in the Presidential moratoria by executive withdrawal of President Clinton in 1998, to be remaining until 2012.

Industry understandably was upset that it had purchased leases on which it could not operate. In 1992, the National Energy Policy Act (H.R. 776) passed by the U.S. House included language requiring buy backs of Bristol Bay oil leases by the federal government, but this provision was dropped during conference with the Senate and was not included in the final bill signed by President Bush on October 24, 1992 (P.L. 102-486). That same year, Conoco, Inc. sued the federal government for breach of contract and sought compensation for its Bristol Bay leases, as well as others offshore the Everglades in Florida, and offshore North Carolina.[cxcviii] Later that year, other companies joined the suit. In 1995, Interior Secretary Babbitt announced settlements with industry wherein they agreed to drop their claims and surrender all leases in Bristol Bay and southwest Florida. Earlier, the MMS had settled claims with other companies on claims in all three areas.[cxcix]

Bristol Bay buyback costs are difficult to ascertain, as the settlement was combined with the Florida leases. According to the Congressional Research Service, "the settlements involved an amount roughly equal to the bonuses paid by the leaseholders."[cc] The Anchorage Daily News reported that oil companies had paid about $300 million for the Bristol Bay and SW Florida lease tracts and that industry had sought $1 billion in damages with their assertion that the congressional moratoriums were a breach of contract and property right taking.[cci]
The bottom line is: as a nation, we must not proceed with the Chukchi Lease Sale at this time.

B. Provide Necessary Funding for Polar Bear Science and Management. As discussed earlier, we do not have reliable information about Chukchi polar bears upon which management decisions can be accurately based. This can and must be remedied. Congress needs to fund the necessary surveying and monitoring research for these bears.

Fish and Wildlife Service also needs funding to implement the "Agreement between the Government of the United States of America and the Government of the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population." Russia and the U.S. signed this bilateral agreement in 2000 and the Senate approved it in 2003. Unfortunately, the Service has not had the resources to implement this treaty. The Alaska Office of the Fish and Wildlife Service has outlined these research and management needs, and has provided funding projections. These critical needs deserve to be funded by Congress immediately.

In announcing the ratification of the Agreement, the Fish and Wildlife Service stated: "Today, habitat loss, illegal hunting, and, in particular, the diminishing extent, thickness and seasonal persistence of sea ice pose the most serious threats to polar bears." [ccii] This reinforces the need to also address the reduction of greenhouse gases, as described below.

C. Reduce Greenhouse Gas Emissions Quickly and Significantly. First of all, we want to thank Congress and this Select Committee for the passage of the Energy Independence and Security Act of 2007. This is an excellent start to reducing our greenhouse gas emissions, but clearly much more needs to be done.

Congress needs to enact the tax package provisions and the Renewable Electricity Standard provisions that were stripped out of the Energy Bill. And, Congress needs to enact comprehensive economy-wide cap and trade legislation that will reduce greenhouse gases by 80% from existing levels by 2050.

VII. There are Many Positive Broader Implications of Taking Actions to Protect Polar Bears, Including Increasing Our Use of Renewable Energy

There are so many positive, broader implications associated with reducing greenhouse gas emissions and taking other actions to protect our nation's polar bears. For purposes of this testimony, I will focus on expanding the use of renewable energy because Alaska can make such significant contributions in this regard.

Indeed, Alaska has a positive role to play in the reduction of greenhouse gas emissions. As described fully in the Renewable Energy Atlas of Alaska,[cciii] America's northernmost state has outstanding and inexhaustible geothermal, wind, biomass, wave, tidal, and hydroelectric energy supplies. [cciv] As the Renewable Energy Atlas states, "With some of the best renewable energy resources in the country, Alaska has an opportunity to be a leader in their development..." We also have great potential for improving energy efficiency in our homes and buildings, both retrofits that could save our rural and low-income residents money quickly and also reduce emissions, and by setting stronger standards for our buildings.

There are some early, exciting renewable energy developments in Alaska that can benefit the entire nation. But there needs to be much more Congressional assistance to achieve Alaska's renewable energy potential.

A. Wind. Alaska has tremendous wind resources that are highly suitable for the generation of electricity and hydrogen in both urban and rural locations. Alaska's first wind farm, located on the Northwest coast of Alaska at Kotzebue, adjacent to the Chukchi Sea, has been displacing a significant portion of the utility's diesel fuel since 1997. To the south, a recently installed wind project in Toksook Bay is providing renewable energy to three remote communities. Wind power is economic, clean, local, and inexhaustible, and deserves considerable support as a major energy producer of the future. Congress should support the work of the Denali Commission and others in the installation of wind generation capacity, and also research the potential for wind to create hydrogen for local use, and ultimately for export.

B. Geothermal. Alaska has tremendous geothermal potential, both for direct use (including district heating, greenhouses, hydrogen production, absorption chilling, process heating in the seafood industry) and for electricity production. Currently, there is an exciting example of geothermal use at Chena Hot Springs Resort[ccv] that can serve as a model for many locations in Alaska as well as the nation and the world. Other large scale plants are also being investigated in Alaska. Recently, MIT issued a report declaring that geothermal power has tremendous potential for the United States, and needs more research and investment. Congress should quickly and decisively support expanded geothermal research and power production.

C. Ocean Power (Wave and Tidal). With our 34,000 miles of coastline (more than the entire nation), Alaska offers exciting opportunities for testing and implementing wave and tidal power. According to the Atlas of Renewable Energy, "Alaska has one of the best wave resources in the world, with parts of its Southcentral and Southeast coastlines averaging 60kW per meter of wave front. The total wave power flux on southern Alaska's coast alone is estimated at 1,250 TWh per year, or almost 300 times the amount of electricity Alaskans use every year!" Congress needs to support the research and financial assistance associated with developing our renewable wave energy as soon as possible.

D. Biomass. Two exciting biomass fuels in Alaska are fish byproducts and municipal waste. Recently, with government assistance, a major processor conducted successful tests of raw fish oil/diesel blends, and now uses approximately one million gallons of up to 70% fish oil for power production each year. There is much more potential. According to the Atlas, "currently state, federal and university groups are working together to assess the potential for recovering a portion of the estimated 12 million gallons of fish oil returned to the ocean each year as fish processing waste". This research and analysis deserve to be supported, and other biofuel opportunities studied and implemented. With respect to waste product, Eielson Air Force Base densifies paper separated from the Fairbanks area waste stream and then uses the paper "cubes" at the base's coal-fired power plant. Between 600 to 3,000 tons of this fuel have been produced per year in 1997. This possibility should be explored throughout the nation.

There is a similar renewable energy potential in many places in the United States. A renewable energy atlas of the Western United States, which was created by a number of non-governmental organizations, underscores this potential.[ccvi]

VIII. The Recommendations, A Recap:

A. *Postpone the Chukchi Lease Sale Until Adequate Information Regarding Polar Bears and Other Key Species Is Available.* As numerous experts have stated and as discussed above, the Interior Department does not have sufficient information about the wildlife and other natural resources of the Chukchi Sea, the impact of global warming on those resources, or what the additional impacts would be on such resources from oil and gas activities. This lack of information pointedly involves polar bears, though it is by no means limited to polar bears and also includes pacific walrus, seals, bowhead and other whales, migratory birds, and the Inupiat culture and subsistence way of life.

Consequently, it is contrary to the best interests of our nation for the Interior Department's Minerals Management Service to hold the Chukchi Sea Oil and Gas Lease Sale 193. Common sense and scientifically-supported prerequisites to holding a Chukchi Sea lease sale would include a final decision on whether to list polar bears under the ESA and to designate critical habitat for polar bears. Assuming that the Interior Department's Fish and Wildlife Service does in fact list the bear and designates critical habitat, full ESA protections must be applied proactively to any proposed Chukchi Sea lease sale.

More fundamentally, before holding a Chukchi Sea lease sale the Interior Department needs significantly more basic baseline information on the Chukchi Sea, the impacts on it of global warming, and the likely impacts on it of oil and gas development. Without gathering and analyzing such information, the Interior Department would unacceptably risk significant environmental harm if it held the lease sale.

B. Provide Critically Needed Funding for Polar Bear Research and Management, Especially for the Chukchi Population. Congress should specifically request from the USFWS a list of needed survey, monitoring and management measures for the protection of our nation's polar bears. This request should emphasize the need for new funding to implement the Bi-lateral Treaty for the protection of the Chukchi population.

C. Take Legislative Actions to Reduce Greenhouse Gas Emissions, Including Funding Renewable Energy Research and Demonstration Projects, Passing Economy-Wide Cap and Trade Legislation, Enacting a Renewable Electricity Standard, and Extending the Production Tax Credits for Renewable Energy Projects.

IX. Conclusion

Thank you.

Our nation is truly at a crossroads in terms of our ability to protect our treasured polar bears for current and future generations. To do so, we must protect them from short-sighted and inadequately informed actions, such as Sale 193; provide necessary science and management funding for their protection; and pass legislation to reduce our nation's greenhouse gas emissions. The fate of America's polar bears, and our fate, is in our hands.

---

[i] Associated Press. Ominous Arctic Melt Worries Experts, (Dec. 11, 2007).

[ii] I want to acknowledge the contributions to this testimony of Peter Van Tuyn of Bessenyey & Van Tuyn Law Firm and Pamela A. Miller, Arctic Coordinator with Northern Alaska Environmental Center.

[iii] The Alaska Climate Research Center, Temperature Changes in Alaska, http://climate.gi.alaska.edu/ClimTrends/Change/TempChange.html (Feb. 28, 2007).

[iv] The Alaska Climate Research Center. Monthly Weather Summaries http://climate.gi.alaska.edu/Summary/current_sum.html (Jan. 9, 2008).

[v] Sandra Hines, Without its insulating ice cap, Arctic surface waters warm to as much as 5 C above average, University of Washington http://uwnews.washington.edu/ni/article.asp?articleID=38531 (December 12, 2007).

[vi] Stephanie Renfrow, "Arctic Sea Ice Shatters All Previous Record Lows," National Snow and Ice Data Center, http://nsidc.org/news/press/2007_seaiceminimum/20071001_pressrelease.html , Oct. 1 2007

[vii] Ibid.

[viii] Thompson, Andrea. "Two new Arctic sea ice signals: Winter ice declining and ice becoming thinner, adding to summer decline." MSNBC, http://www.msnbc.msn.com/id/20959884/print/1/displaymode/1098 (Sep. 24, 2007).

[ix] The Herald. *Summer ice in Arctic 'will be gone in under five years.'* http://www.theherald.co.uk/misc/print.php?artid=1901193 (Dec. 13, 2007).

[x] Mason Inman, *Warming Oceans Contributed to Record Arctic Melt*, National Geographic News http://news.nationalgeographic.com/news/pf/46662051.html (Dec. 14, 2007).

[xi] Associated Press, *Scientists project two-thirds drop in polar bear population by 2050*, Publication: Associated Press Archive, (Sep. 8, 2007).

[xii] The University Corporation for Atmospheric Research, *Abrupt Ice Retreat Could Produce Ice-Free Arctic Summers by 2040* http://www.ucar.edu/news/releases/2006/arctic.shtml (Dec. 11, 2006).

[xiii] The U.S. Fish and Wildlife Service is the agency that has statutory responsibility for managing polar bears.

[xiv] U.S. Fish and Wildlife Service, "Frequently Asked Questions" http://www.doi.gov/news/06_News_Releases/061227faq.html (Dec. 27, 2006).

[xv] Harden, Blaine. "Experts Predict Polar Bear Decline Global Warming Is Melting Their Ice Pack Habitat." *Washington Post* (July 7, 2005) http://www.washingtonpost.com/

[xvi] Amstrup, S.C. 2003. Polar bear, Ursus maritimus. In: G.A. Feldhamer, B.C. Thomson and J.A. Chapman (eds) Wild Mammals of North America: biology, management, and conservation, pp: 587¿610. John Hopkins University Press, Baltimore.

[xvii] Regehr1, E.V., et.al. Polar Bears in the Southern Beaufort Sea I: Survival and Breeding in Relation to Sea Ice Conditions, 2001-2006. *USGS Science Strategy to Support U.S. Fish and Wildlife Service Polar Bear Listing Decision* (2007) http://www.usgs.gov/newsroom/special/polar_bears/docs/USGS_PolarBear_Regehr_SB-II_Estimation.pdf

[xviii] Amstrup, S., et al., Forecasting the Range-wide Status of Polar Bears at Selected Times in the 21st Century. *USGS Science Strategy to Support U.S. Fish and Wildlife Service Polar Bear Listing Decision* (2007) http://www.usgs.gov/newsroom/special/polar_bears/docs/USGS_PolarBear_Amstrup_Forecast_lowres.pdf

[xix] Regehr, E.V., Amstrup, S.C. and Stirling, I., *Polar Bear Population Status in the Southern Beaufort Sea.* U.S. Geological Survey, Open-File Report 2006-1337 http://pubs.usgs.gov/of/2006/1337/pdf/ofr20061337.pdf (2006)

[xx] Ibid

[xxi] Ibid

[xxii] Final Environmental Impact Statement for Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea ("FEIS") at III-51 (the full FEIS is available at http://www.mms.gov/alaska/ref/EIS%20EA/Chukchi_feis_Sale193/feis_193.htm.)

[xxiii] Carlton, J. *Is Global warming killing the Polar Bears?* The Wall Street Journal. http://online.wsj.com/public/article_print/SB113452435089621905-vnekw47PQGtDyf3iv5XEN71_o5I_20061214.html (Dec. 14, 2005).

[xxiv] Fischbach, A. Puckett, C. USGS Finds Polar Bear Denning Shifting From Sea Ice to Coastal Habitats in Northern Alaska. U.S. Geological Survey, http://www.doi.gov/news/07_News_Releases/070712.html (July 12, 2007)

[xxv] Regehr, E.V., Amstrup, S.C. and Stirling, I., *Polar Bear Population Status in the Southern Beaufort Sea.* U.S. Geological Survey, Open-File Report 2006-1337 http://pubs.usgs.gov/of/2006/1337/pdf/ofr20061337.pdf (2006)

[xxvi] Leahy, S. *Polar Bears Go Hungry as Icy Habitat Melts Away.* IPS-Inter Press Service http://www.ipsnews.net/news.asp?idnews=35524 (Nov. 17, 2006).

[xxvii] Knickerbocker, B. *Charismatic bears on thin ice: As the Arctic heats up sooner than scientists anticipated, animals like the polar bear are losing ground.* Christian Science Monitor http://www.csmonitor.com/2007/0913/p03s03-wogi.html (Sep. 13, 2007)

[xxviii] ACIA, 2005.Arctic Climate Impact Assessment (ACIA). Cambridge University Press. http://www.acia.uaf.edu

[26] See National Oceanic Atmospheric Administration (NOAA) Northeast Fisheries Science Center, Large Marine Ecosystem information, http://na.nefsc.noaa.gov/lme/text/lme54.htm (visited Jan. 11, 2008).

[xxx] See e.g., Arctic Circle, Inupiat of Arctic Alaska, University of Connecticut, http://arcticcircle.uconn.edu/HistoryCulture/ (visited Jan. 11, 2008); see also Letter from Robert Mecum, NMFS to John Goll, MMS re DEIS for Sale 193 at page 2 (Jan. 30, 2007) (Jan. 2007 NMFS letter) ("Much of the coastal region within the Sale 193 area is an important subsistence hunting area for Alaska Native villages on the Chukchi Sea.").

[xxxi] Stock Assessment Report, Polar Bear – Chukchi/Bering Seas Stocks. Marine Mammal Management http://alaska.fws.gov/fisheries/mmm/stock/finalpbcbseas.pdf (Aug. 23, 2002).

[xxxii] Schliebe, S. et al. Range-wide status review of the polar bear (ursus maritiums), http://alaska.fws.gov/fisheries/mmm/polarbear/pdf/Polar_Bear_%20Status_Assessment.pdf (Dec. 2006)

[xxxiii] Fish and Wildlife Service, Marine Mammals; Incidental Take during Specified Activities; Proposed Rule, 72 Fed. Reg. 36,670, 36,678 (June 1, 2007).

[xxxiv] FEIS IV-168.

[xxxv] Following a meeting at the University of Alaska Fairbanks, the IUCN Polar Bear Specialist Group was formed. It consists of 16 scientists from the five nations that are signatories to the International Agreement, including the US. Every 3 to 4 years, this group convenes to carefully assess the status of polar bear populations, given the available data. The last meeting was held in 2005. This is the most authoritative group on polar bears in the world.

[xxxvi] Polar Bear Specialist Group (PBSG), Polar Bears and Climate Warming, IUCN http://pbsg.npolar.no/ (Dec. 19, 2007).

[xxxvii] PBSG – Chukchi Sea Polar Bear Subpopulation Table, http://pbsg.npolar.no/StatusTabComm/cs.htm

[xxxviii] FEIS III-51.

[xxxix] FEIS IV-180.

[xl] FEIS V-35.

[xli] FEIS III-74-76.

[xlii] FEIS III-74-76.

[xliii] Biological Evaluation of Spectacled Eider, Steller's Eider, and Kittlitz's Murrelet, available at http://www.mms.gov/alaska/ref/Biological_opinions_evaluations.htm The FEIS incorporates the biological evaluation by reference and relies upon the document to for its analysis of eiders. FEIS III-61, IV-125.

[xliv] January 2007 NMFS letter at page 1.

[xlv] See Letter from Robert Mecum, NMFS to John Goll, MMS re DEIS for Sale 193 at page 1 (Jan. 30, 2007) (Jan. 2007 NMFS letter).

[xlvi] E.g., Marine Mammal Protection Act; Endangered Species Act; Magnuson-Stevens Fishery Conservation and Management Act.

[xlvii] See Letter from Christine Reichgott, EPA to John Goll, MMS re Draft Environmental Impact Statement, at page 1 (Dec. 27, 2006) (December 2006 EPA letter).

[xlviii] December 2006 EPA letter at 2.

[xlix] Memo from Thomas O. Melius, USFWS Regional Director to John Goll, MMS Regional Director (Dec. 19, 2006). This letter is included as Document 17 in FEIS, Vol. II, Section VII, Comments and Responses. See http://www.mms.gov/alaska/ref/EIS%20EA/Chukchi_feis_Sale193/Vol%20II%20Sec%205%20WEB.pdf.

[l] FEIS II-37.

[li] FEIS IV-156.

[lii] FEIS IV-101; see also FEIS IV-103 ("Insufficient data exists to determine the current migration paths or the numbers of whales that might be deflected from those paths. Data are also not available to determine how intensely bowheads feed during the autumn migration in the Chukchi Sea or whether large aggregations exist in certain places due to prey resources."); FEIS IV-121 (same).

[liii] FEIS III-76.

[liv] FEIS AC 019-076 ("existing information is insufficient to understand the dynamics of gray whales and offshore Chukchi Sea habitat relationships, quality and quantity dynamics and distribution of prey resources, or the capability of habitat to support (carrying capacity) long- and short-term whale use.")

[lv] FEIS III-71.

[lvi] FEIS II-37.

[lvii] FEIS II-37.

[lviii] FEIS III-34.

[lix] See e.g., Cumulative Environmental Effects Of Oil and Gas Activities on Alaska's North Slope, National Academy of Sciences (NAS Report) at 3, 44-45, 52-80, 227 (March 2003) (general description of North Slope oil industry infrastructure); see also Alaska Department of Natural Resources, Division of Oil and Gas (well database, last updated in 2002), http://www.dog.dnr.state.ak.us/oil/products/data/wells/wells.htm (visited December 2, 2007); U.S. Bureau of Land Management. *Alpine Satellite Development Plan. Final Environmental Impact Statement. Vol. 2.* Table 4G.4.4-2; State of Alaska, DNR, *Historical and Projected Oil and Gas Consumption, (1999).* Appendix B, p.51; U.S. Army Corps of Engineers. June 24, 1997. Colville River 17 permit (4-960869) to Nuiqsut Constructors

---

(Alpine gravel pit). U.S.Fish & Wildlife Service. 1987. P. 12; U.S. Department of the Interior, Bureau of Land Management. November 2002. *Final environmental impact statement: Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way.* Vol. 2, Table 3.5-1; Vol. 7, Map Atlas pp. 1-6. 12 U.S. DOI, BLM. 2003., *Northwest National Petroleum Reserve-Alaska. Final Integrated Activity Plan/ Environmental Impact Statement*, Vol. 3, Table IV-09.

[lx] Alaska Department of Environmental Conservation spill database 1996-2004 (no villages, DEWlines).

[lxi] Anchorage Daily News. BP Fined, Rebuked for Oil Spill, (Nov. 11, 2007).

[lxii] Alaska Department of Environmental Conservation. 1993. The *Exxon Valdez* Oil Spill: Final Report, State of Alaska Response. P. vii.

[lxiii] Carson, R.T., et al. November 10, 1992. *A contingent valuation study of lost passive use values resulting from the Exxon Valdez oil spill.* A report to the Attorney General of the State of Alaska.

[lxiv] ExxonValdez Oil Spill Trustees Council. November 2006. Update on Injured Resources and Services 2006. Anchorage. http://www.evostc.state.ak.us/Universal/Documents/Publications/2006IRSUpdate.pdf (accessed Jan. 12, 2008)

[lxv] C.H. Peterson, 2001, The "Exxon Valdez" oil spill in Alaska: acute, indirect and chronic effects on the ecosystem, *Advances in Marine Biology*, Vol. 39:1-62.

Rice, S.D., R.B. Spies, D.A. Wolfe, and B.A. Wright (eds). 1996. *Proceedings of the Exxon Valdez oil spill symposium.* American Fisheries Society. 931 pp.

[lxvi] Babcock, M.M. et al. 1996. Persistence of oiling in mussel beds three and four years after the Exxon Valdez oil spill, pp. 286-297, *Exxon Valdez Oil Spill Symposium*, American Fisheries Society Symposium 18.

[lxvii] ExxonValdez Oil Spill Trustees Council. November 2006. Update on Injured Resources and Services 2006. Anchorage. http://www.evostc.state.ak.us/Universal/Documents/Publications/2006IRSUpdate.pdf (accessed Jan. 12, 2008)

[lxviii] *Anchorage Daily News*. Orca family may receive protection, (Jan. 26, 2003)

[lxix] National Marine Fisheries Service. 69 FR 31321-31324. Designation of the AT1 Group of transient killer whales as a depleted stock under the Marine Mammals Protection Act, (June 3, 2004).

[lxx] Heintz, R.A., J.W. Short, and S.D. Rice, 1999. Sensitivity of pink salmon to weathered crude oil, *Environmental Toxicology and Chemistry* 18(3).

lxxi Anchorage Daily News. U.S. Supreme Court to hear Exxon Valdez appeal. http://community.adn.com/adn/node/112532 (accessed Jan. 12, 2008) (Oct. 29, 2007).

[lxxii] Exxon Valdez Trustees Council. 2006. Reopened Demand Letter. www.evostc.state.ak.us/News/reopener.cfm (accessed Jan. 12, 2008).

[lxxiii] U.S. Army Corps of Engineers. 1999. *Final Environmental Impact Statement, Beaufort Sea Oil and Gas Development/ Northstar Project.* Vol. III, Table 5.4-6, data from ARCO and BPXA, 1994, as reported to Alaska Department of Environmental Conservation. Emissions estimates based on fuel consumption for Prudhoe Bay, Endicott, Lisburne and Kuparuk oil field main production facilities but does not include Alpine, Badami, Pt. McIntyre, Tarn and Northstar oil fields or four Trans-Alaska Pipeline Pump Stations, nor emissions from drill rig engines or vehicles. This is more than twice the amount emitted by Washington, D.C. EPA. March 2000. *National Air Pollutant Emissions Trends: 1900-1998.* DC- 23,000 short tons (Table 2.2).

[lxxiv] U.S. Army Corps of Engineers. June 1999. Final Environmental Impact Statement Beaufort Sea Oil and Gas development/Northstar Project. Volume III, Table 5.4-7.

[lxxv] Jaffe, D.A. R.E. Honrath, D. Furness, T.J. Conway, E. Dlugokencky, and L.P. Steele. 1995. A determination of the CH4, NOx and CO2 emissions from the Prudhoe Bay, Alaska Oil Development. Journal of Atmospheric Chemistry 20: 213-227.

[lxxvi] NAS Report at 141.

[lxxvii] Jaffe, D.A., R.E. Honrath, D. Furness, T.J. Conway, E. Dlugokencky, and L.P. Steele. 1995. A determination of the CH_4, NOx, and CO_2 emissions from the Prudhoe Bay, Alaska oil development. Journal of Atmospheric Chemistry 20: 213-227.; Brooks, S.B., T.L. Crawford, and W.C. Oechel. 1997. Measurement of carbon dioxide emissions plumes from Prudhoe Bay, Alaska oil fields. Journal of Atmospheric Chemistry 27: 197-207.

[lxxviii] Alaska Department of Environmental Conservation. January 2008. *Draft Summary Report of improvements to the Alaska Greenhouse Gas Emission Inventory.* www.climatechange.alaska.gov/docs/ghg_ei_rpt.pdf (accessed Jan. 14, 2008). This report did not cover the GHG's chloroflourocarbons, hydrofluorocarbons, perfluorocarbons, halons, and suphur hexafluoride.

[lxxix] State of Alaska, Department of Environmental Conservation. 1990. Oil and Gas Waste Management Issue and Recommendations for the Arctic National Wildlife Refuge. Appendix I, p. 59

[lxxx] Alaska Department of Environmental Conservation. January 2008. *Draft Summary Report of improvements to the Alaska Greenhouse Gas Emission Inventory.* www.climatechange.alaska.gov/docs/ghg_ei_rpt.pdf (accessed 1-14-2008).

[lxxxi] AMAP (Arctic Monitoring and Assessment Programme). 1997. *Arctic pollution issues: A state of the Arctic environmental report.* Oslo. P.151.

[lxxxii] M. Lynne Corn, North Slope Infrastructure and the ANWR Debate, Congressional Research Service, RL32108, Summary (October 13, 2003).

[lxxxiii] ARCO, Discovering the Future (1998).

[lxxxiv] Specifically, the development includes Alpine Pad #1 (main production pad, drill site, housing, storage area) – 36.3 acres; Alpine Pad #2 (drilling site) – 10.1 acres; in-field roads (3-miles long) – 14.6 acres; airfield – 35.7 acres; other (culverts, etc.) – 1.7 acres. See U.S. Army Corps of Engineers Alaska District, Permit Evaluation and Decision Document, Alpine Development Project, Colville River 18 (2-960874), p. 2 (Feb. 13, 1998).

[lxxxv] Arco Alaska Inc. et al., Revised Alpine Development Project: Environmental Evaluation Document, pp. 2-13 (Sep. 1997).

[lxxxvi] U.S. Army Corps of Engineers Alaska District, Permit Evaluation and Decision Document, Alpine Development Project, Colville River 18 (2-960874), p. 3 (February 13, 1998).

[lxxxvii] U.S. Army Corps of Engineers Alaska District, Colville River 17 (4-960869) to Nuiqsut Constructors (Alpine gravel pit) (June 24, 1997).

[lxxxviii] Nellemann, C., and R.D. Cameron, Cumulative Impacts Of An Evolving Oilfield Complex On Calving Caribou, Canadian Journal of Zoology, 76:1425-1430 (1998); see also Loya, Schoen Caribou Calving Habitat Analysis for Teshekpuk Lake: A Conceptual Approach (Oct. 2007).

[lxxxix] Johnson, C.B., B.E. Lawhead, D.C. Payer, J.L. Petersen, J.R. Rose, A.A. Stickney, and A.M. Wildman. May 2001. *Alpine avian monitoring program, 2000. Third annual report.* Prepared for Phillips Alaska, Inc. and Kuukpik Unit Owners. ABR, Inc. Fairbanks. P. I.

[xc] ARCO Alaska, Inc., Anadarko Petroleum Corporation, and Union Texas Petroleum. September 1997 (revised). *Alpine Development Project: Environmental Evaluation Document.* Table 2.3.1.

[xci] City of Nuiqsut. 2001. NPR-A grant information, submitted by R. Ahtuangaruak to National Research Council on April 5, 2001. See also Committee On Resources, U.S. House Of Representatives, H.R. 39, Arctic Coastal Plain Domestic Energy Security Act Of 2003; And H.R. 770, Morris K. Udall Arctic Wilderness Act, Legislative Field Hearing, Kaktovik, Alaska, Serial No. 108-13, 108th Congress, 1st See., pages 11-17 (April 5, 2003) (testimony of Robert Thompson), http://bulk.resource.org/gpo.gov/hearings/108h/86329.pdf (visited Dec. 12, 2007).

[xcii] Associated Press, Alpine Drilling Revised, Anchorage Daily News, page D6 (Oct. 2, 1998).

[xciii] Bodron, D. 2003. Information on 2000 flaring (Gas2000 North Slope.xls; Re 2000 flaring.rtf) from Wendy Mahan, Alaska Department of Natural Resources, (April 6, 2001).

[xciv] Argo, J. 2001. Unhealthy effects of upstream oil and gas flaring. A report prepared for Save Our Seas and Shores, for presentation before the Public Review Commission into effects of potential oil and gas exploration, drilling activities within Licences 2364, 2365, 2368. Sydney, Nova Scotia, IntrAmericans Centre for Environment and Health, Wolfe Island, ON, Canada.(Jan. 18, 2002).

[xcv] Letter to National Research Council submitted by Vice-Mayor R. Ahtuangaruak (April 11, 2001) (discussing flaring and local health concerns); U.S. Army Corps of Engineers. 1999. Final Environmental Impact Statement, Beaufort Sea Oil and Gas Development/ Northstar Project. Appendix K. Testimony from Nuiqsut public hearing, July 30, 1998, p. 47-48 (same); Statement of Aaron Wernham, MD, MS, Alaska Inter-Tribal Council, Health Impact Assessment Project Fellow, Columbia University Center on Medicine as a Profession, Oil and Gas Development: Exemptions in Health and Environmental Protections, Committee on Oversight and Government Reform, U.S. House of Representatives, page 4. Nuiqsut is located on the Colville River south of the Alpine development, (Oct. 31, 2007).

[xcvi] Argo, J. 2001. Unhealthy effects of upstream oil and gas flaring. A report prepared for Save Our Seas and Shores, for presentation before the Public Review Commission into effects of potential oil and gas exploration, drilling activities within Licences 2364, 2365, 2368. Sydney, Nova Scotia, January 18, 2002. IntrAmericans Centre for Environment and Health, Wolfe Island, ON, Canada.

[xcvii] U.S. Army Corps of Engineers Alaska District, Permit Evaluation and Decision Document, Alpine Development Project, Colville River 18 (2-960874), p. 30, 31 (Feb. 13, 1998).

[xcviii] Senator Frank Murkowski. April 17, 2002. Congressional Record. S2867-2868.

[xcix] BLM. November 8, 2004. *Alpine Satellite Development Plan Record of Decision*. Signed by Rebecca W. Watson, Assistant Secretary Land and Minerals Management; U.S. Army Corps of Engineers. December 6, 2004. *Record of Decision, Alpine Satellite Development Project, Satellites CD-3and CD-4*. Signed by Colonel Timothy J. Gallagher; Alpine Satellites: U.S. Army Corps of Engineers. December 6, 2004. *Record of Decision, Alpine Satellite Development Project, Satellites CD-3 and CD-4*. Signed by Colonel Timothy J. Gallagher. Table 1, P.6.; U.S. Army Corps of Engineers. September 3, 2004. *Public Notice POA-2004-253-2, Colville River*. (ConocoPhillips Alpine satellites CD-3, CD-4). Table 2, (CD-5, CD-6, CD-7); see also Larry Houle, Construction in Alaska's Oil Patch, Alaska Support Industry Alliance Newsletter, Vol. 20, No. 24, page 4 (4th Quarter 2004) (outlining new construction at the Alpine oil field), http://www.alaskaalliance.com/pdf/2005_4thqtr_thelink_newsletter.pdf (visited Dec. 12, 2007).

[c] BLM. January 2005. *Final Amendment to the Northeast National Petroleum Reserve: Integrated Activity Plan/ Environmental Impact Statement*. Vol.2, Response to comments; Kuukpik Corporation, Native Village of Nuiqsut, City of Nuiqsut, and Kuukpikmuit Subsistence Oversight Panel. Comment Letter No. 197616. p.6-262.

[ci] BLM. January 2005. Response to Comment Letter No. 197616. P.6-263; 6-271.

[cii] City of Nuiqsut Council Members Letter to National Research Council submitted by Vice-Mayor R. Ahtuangaruak. Nuiqsut is located on the Colville River south of the Alpine development, (April 11, 2001).

[ciii] U.S. Army Corps of Engineers. 1999. Final Environmental Impact Statement, Beaufort Sea Oil and Gas Development/ Northstar Project. Appendix K. Testimony from Nuiqsut public hearing, July 30, 1998,p. 47-48.

[civ] City of Nuiqsut. 2001. NPR-A grant information, submitted by R. Ahtuangaruak to National Research Council on April 5, 2001; see also U.S. Committee On Resources, U.S. House Of Representatives, H.R. 39, Arctic Coastal Plain Domestic Energy Security Act Of 2003; And H.R. 770, Morris K. Udall Arctic Wilderness Act, Legislative Field Hearing, Kaktovik, Alaska, Serial No. 108-13, 108th Congress, 1st Sess., pages 11-17 (April 5, 2003) (testimony of Robert Thompson), http://bulk.resource.org/gpo.gov/hearings/108h/86329.pdf (visited Dec. 12, 2007).

[cv] Statement of Aaron Wernham, MD, MS, Alaska Inter-Tribal Council, Health Impact Assessment Project Fellow, Columbia University Center on Medicine as a Profession, Oil and Gas Development: Exemptions in Health and Environmental Protections, Committee on Oversight and Government Reform, U.S. House of Representatives, page 4, (Oct. 31, 2007).

[cvi] Phillips, N. Pollution's price tag: $1 million, Slope driller pleads guilty to filling wells with waste, *Anchorage Daily News*. p. A1. (May 1, 1998).

[cvii] *Fairbanks Daily News-Miner*. Sept. 24, 1999; *Wall Street Journal* [Dow Jones Newswires], (Sept. 23, 1999).

[cviii] Alaska Forum for Environmental Responsibility. *Poisoning the Well*. 1997; and "Statement of Randy Ruedrich, General Manager, Doyon Drilling, Inc., before the Committee on Energy and Natural Resources," U.S. Senate, (July 18, 1995).

[cix] Alaska Department of Natural Resources. December 2004. *Alaska Oil and Gas Report*. www.dog.dnr.stat.ak.us. p. 3-35, (accessed May 26, 2005).

[cx] ADEC found that BP had violated the 2001 compliance order, violated its permit by operating equipment which was not covered by it, exceeded the NOx emission limits in its permit, and was in violation of state law due to the permit violations. In June 2004, ADEC found that BP was operating out of compliance with its permit conditions, the compliance order, and state air quality regulations. ADEC Compliance Letter #04-402-37-3514. (June 22, 2004). As of April 2005, BP was still operating under ADEC's 2003 compliance order and reported emissions and flaring levels that exceed the permitted levels. BP letter to ADEC. April 26, 2005. Submittal of quarterly status report for January to March 2005, as required by COBC No. 2001-637-50-2654.

[cxi] BP letter to ADEC. April 26, 2005. Submittal of quarterly status report for January to March 2005, as required by COBC No. 2001-637-50-2654.

[cxii] NRC. 2003. pp.253, 169.

[cxiii] U.S. Minerals Management Service. 1997. Arctic seismic synthesis and mitigating measures workshop, Barrow, AK, March 5-6, 1997. Anchorage, AK: USDOI, MMS, Alaska OCS Region

[cxiv] Ibid.

[cxv] ADEC. Spill database; Historical data, pre-7/1/1995, (Dec. 18, 2002).

[cxvi] ADEC. Spill Database, (Dec. 18, 2002).

[cxvii] ADEC. Spill database; Historical data, pre-7/1/1995, (Dec. 18, 2002).

[cxviii] NOAA Response Report.Crowley barge tanker 570, Flaxman Island, Beaufort Sea Alaska, (Aug. 21, 1988).

[cxix] USFWS. 1982 in: Miller, P.A., D.Smith, and P.K. Miller. 1993. *Oil in Arctic Waters.* Greenpeace, Anchorage, AK. 122pp.

[cxx] Phillips Alaska, Inc. 2000. *Exploration Plan McCovey #1 Well.* Submitted to Minerals Management Service, Anchorage.

[cxxi] ARCO Alaska Inc. 1997. *Exploration Plan, ARCO Warthog No. 1 exploration well.* Submitted to Minerals Management Service, Alaska.

[cxxii] Snyder-Conn, E., D. Densmore, C. Moitoret, and J. Stroebele. 1990. Persistence of trace metals in shallow Arctic marine sediments contaminated by drilling effluents. *Oil and Chemical Pollution* 7: 225-247.

[cxxiii] EPA. 24 May 1995. Final NPDES general permit for offshore oil and gas operations on the Outer Continental Shelf (OCS) and state waters of Alaska: Arctic NPDES general permit (No. AKG28420). 60 FR 27508-27523.

[cxxiv] *Wall Street Journal, Financial Times*, (Oct. 19, 2005).

[cxxv] St. Aubin, D.J., 1990a, Psychological and toxic effects on pinnipeds, in *Sea Mammals and Oil: Confronting the Risks*, Geraci and J.R. and St. Aubin, D.J. (Eds.). Academic Press, New York , 103-107

St. Aubin, D.J., 1990b, Psychological and toxic effects on polar bears, in *Sea Mammals and Oil: Confronting the Risks*, Geraci and J.R. and St. Aubin, D.J. (Eds.). Academic Press, New York , 235-240

[cxxvi] FEIS IV-165.

[cxxvii] U.S. Fish and Wildlife Service. June 2006. Environmental Assessment. Final Rule to Authorize the incidental take of small numbers of polar bear (*Ursus maritimus*) and Pacific Walrus (*Odobenus rosmarus divergens*) during oil and gas activities in the Beaufort Sea and adjacent coastal Alaska. http://alaska.fws.gov/fisheries/mmm/itr.htm (accessed Jan. 13, 2008)

[cxxviii] Amstrup, S.C., and C. Gardner. Hazard Notice, Polar bear killed by improper use, storage, or disposal of hazardous material. Alaska Fish and Wildlife Research Center, Anchorage, (Sep. 27, 1988).

[cxxix] U.S. Fish and Wildlife Service. 1995. Habitat conservation strategy for polar bears in Alaska. Marine Mammals Management, Anchorage, Alaska. 232pp.

[cxxx] Oritsland, N.A., F.R. Engelhardt, R.A. Juck, R.J. Hurst, and P.D. Watts. 1981. Effect of crude oil on polar bears. Norther Affairs Program, Eastern Arctic Marine Environmental Studies Program Environmental Study No. 24. Ottawa, Ont., Canada: Indian and Northern Affairs Canada, 268 pp.

[cxxxi] FEIS Table IV.A-1

[cxxxii] See e.g., MMS, Environmental Assessment for Shell Exploration Plan (February 2007) (available at http://www.mms.gov/alaska/ref/EIS%20EA/SOIea/SOI_ea.pdf) (detailing Shell's proposed activities); Wesley Loy, Shell's rocky return; Oil giant's plans to go after oil in Beaufort and Chukchi seas have to wait, Anchorage Daily News http://www.adn.com/money/industries/oil/story/9234608p-9150246c.html (discussing components of Shell's proposed activities) (Aug. 19, 2007).

[cxxxiii] FEIS IV-11.

[cxxxiv] FEIS IV-20.

[cxxxv] FEIS IV-33.

[cxxxvi] For spills that would occur during summer within 360 days to a variety of resources, including, Hannah Shoal (ERA 47); spring bowhead migration route in the Chukchi Polynya from Icy Cape to Barrow (ERA 6); Minerals Management Service, 2007, Chukchi Sea Planning Area, Oil and gas lease sale 193 and seismic surveying activities in the Chukchi Sea, FEIS Appendix A.2, Table A.2-30; Cape Thompson FEIS IV-135, Cape Lisburne, FEIS IV-139.

[cxxxvii] An oil spill that reaches the LBCH when spectacled eiders are present and molting, and thus unable to fly away, may appreciably affect the continued survival and recovery of spectacled eiders, according to the USFWS biological opinion. USFWS Biological Opinion for Chukchi Sea Planning Area Oil and Gas Lease Sale 193, 50, available at http://www.mms.gov/alaska/ref/Biological_opinions_evaluations.htm. If oil reaches the spring lead system, which Steller's eiders use to migrate up to their nesting areas in spring, the majority of Alaska-breeding Steller's eiders could be contacted and killed, which would he a "catastrophic population-level mortality event for this listed species." According to MMS's analysis, depending on where a large oil spill occurs, it has up to a 26% chance of contacting the spring lead system if it does occur.

[cxxxviii] North Slope Borough, June 5, 2007, Letter from Johnny Aiken, Director, Planning Department to Gary Mendivil, Alaska Department of Environmental Conservation and Ben A. Greene, Office of Project Management and Permitting, ADNR, on ACMP review comments, Oil Spill Prevention and Response Comments, p. 1.

[cxxxix] FEIS, Appendix A, Table a.1-1

[cxl] FEIS, Vol. II, Response to Comment NAEC 011-003.

[cxli] The Arctic Council is conducting an Arctic Marine Shipping Assessment (PAME, Progress Report, 2006, (http://arcticportal.org/pame/amsa, in which it explains is following up on the results of the Arctic Climate Impact Assessment which found that "reduced sea ice is likely to increase marine transport…," (accessed on July 16, 2007).

[cxlii] Lawson W. Brigham, February 6, 2006, Changing marine Access in the Arctic Ocean and the Arctic Council's Response, presentation at Alaska Forum on the Environment; http://www.akcf.org/_attachments/climate_change/3Brigham.pdf,)accessed on July 16, 2007).

[cxliii] Cumulative Environmental Effects Of Oil and Gas Activities on Alaska's North Slope, National Academy of Sciences (NAS Report) (March 2003).

[cxliv] Alaska Department of Environmental Conservation. Letter to BP Exploration (Alaska) Inc. and ARCO Alaska Inc. on ADEC- Minerals Management Service Joint Evaluation of the Fall 1999 North Slope Drills and Exercises, (Jan. 18, 2000).

Alaska Department of Environmental Conservation. NorthStar operations Oil Discharge Prvention and Contingency Plan, Compliance Order by Consent to BP Exploration (Alaska) Inc. Consert Order No. 00-162-50-1456. (May 11, 2000).

[cxlv] E. DeCola, T. Robertson, S. Fletcher, S. Harvey, 2000. Offshore oil spill response in dynamic ice conditions: A report to WWF on considerations for the Salhalin II Project.

[cxlvi] South Korea Cleans Up Big Oil Spill New York Times, http://www.nytimes.com/2007/12/10/world/asia/10skorea.html?ex=1197867600&en=f48e91febd200d7e&ei=5070&emc=eta1 (Dec. 10, 2007).

[cxlvii] Clean Up of North Sea Oil Spill Hindered, TVNZ New Zealand, http://tvnz.co.nz/view/page/536641/1502708 (Dec. 13, 2007).

[cxlviii] FEIS IV-152.

[cxlix] FEIS IV-156.

[cl] FEIS, II-37.

[cli] FEIS, Vol. III, Response to Comment AC 019-142.

[clii] See also W.R. Freudenburg and R. Gramling, 1994, Oil in Troubled Waters, pp. 106-116, 147-149.

[cliii] U.S. Fish and Wildlife Service. Memo from Thomas O. Melius, Regional Director USFWS to John Goll, Regional Director MMS on DEIS Chukchi Sea Sale 193. FEIS, Vol. II, Document 17, (Dec. 19, 2006).

[cliv] FEIS IV-164.

[clv] FEIS IV-163.

[clvi] FEIS IV-165.

[clvii] Ibid.

[clviii] FEIS IV-166.

[clix] FEIS IV-170.

[clx] Ibid.

[clxi] National Research Council, 2003, p. 106.

[clxii] Amstrup, S.A. 1999. Estimating potential effects of hypothetical oil spills on polar bears. Supporting documents for U.S. Fish and Wildlife Service incidental take regulations under the Marine Mammal Protection Act. Anchorage. 19pp.

[clxiii] Amstrup, S.A., G.M. Durner, and T.L. McDonald. 2000. Estimating potential effects of hypothetical oil spills from the Liberty oil production island on polar bears. 42. pp. Appendix J in: U.S. Minerals Management Service. 2001. Liberty Development and Production Plan, draft environmental impact statement, Vol. III. Alaska OCS Region, Anchorage.

[clxiv] FEIS IV-167.

[clxv] FEIS IV -164.

[clxvi] Ibid.

[clxvii] Ibid.

[clxviii] Ibid (emphasis added).

[clxix] Alaska Department of Fish and Game, Polar Bears, http://www.adfg.state.ak.us/pubs/notebook/marine/polarbea.php (visited Jan. 11, 2008).

[clxx] *See* Extension of comment period; notice of availability of new information related to the Proposed Rule to List Polar Bear (Ursus maritimus) as Threatened Throughout Its Range, 72 Fed. Reg. 56,979 (Oct. 5, 2007).

[clxxi] *See* U.S. Geological Survey, New Polar Bear Finding, *available at* http://www.usgs.gov/newsroom/special/polar_bears/ (last visited Dec. 20, 2007) (listing and providing links to the nine reports).

[clxxii] *See e.g.* Karyn D. Rode, et al., Polar Bears in the Southern Beaufort Sea III: Stature, Mass, and Cub Recruitment in Relationship to Time and Sea Ice Extent Between 1982 and 2006, 9-13 (U.S. Geological Survey 2007) (making finding for Southern Beaufort polar bears).

[clxxiii] Scott Bergen, et al., Predicting Movements of Female Polar Bears between Summer Sea Ice Foraging Habitats and Terrestrial Denning Habitats of Alaska in the 21st Century: Proposed Methodology and Pilot Assessment, 5 (U.S. Geological Survey 2007).

[clxxiv] *See* Eric V. Regher, et al., Polar Bears in the Southern Beaufort Sea I: Survival and Breeding in Relation to Sea Ice Conditions, 2001-2006 (U.S. Geological Survey 2007). For a further discussion of the impacts of oil and gas activities on polar bear, see the March 2003 National Academy of Sciences report on the cumulative environmental impacts of North Slope oil development at pages 103-106. http://www.nap.edu/openbook.php?record_id=10639&page=103.

[clxxv] Conservation Concerns for Cetaceans in the Bering Sea and Adjacent Waters; Offshore Oil Development and Other Threats, WWF (May 2007) (pages 4, 7 discuss whales and the Chukchi) available at http://www.worldwildlife.org/cetaceans/pubs/2007whalereport.pdf (visited Jan. 11, 2008) (WWF Whale Report).

[clxxvi] WWF Whale Report at 10-12.

[clxxvii] Record Sea Ice Retreat: Walrus Conservation and Management Issues in the Chukchi Sea (U.S. Fish and Wildlife Service, 2007), *available at* http://www.r7.fws.gov/fisheries/mmm/walrus/pdf/walrus_conservation_issues_chukchi.pdf

[clxxviii] *See* Record Sea Ice Retreat at 1; *see also Climate Scientists: 'The Arctic is Screaming'*, Juneau Empire, at A1 (stating "the dwindling sea ice already has affected wildlife, with 6,000 walruses coming ashore in northwest Alaska in October for the first time in recorded history") (Dec. 12, 2007); Dan Joling, *Walruses flee shrinking ice for shoreline*, Anchorage Daily News *available at* http://dwb.adn.com/news/alaska/wildlife/marine/story/9356630p-9269576c.html (Oct. 5, 2007).

[clxxix] *See* Record Sea Ice Retreat at 1; *see also* Dan Joling, *Walruses flee shrinking ice for shoreline*, Anchorage Daily News *available at* http://dwb.adn.com/news/alaska/wildlife/marine/story/9356630p-9269576c.html, (Oct. 5, 2007).

[clxxx] Dan Joling, *Walruses crowd ashore, die in stampedes*, Anchorage Daily News *available at* http://www.adn.com/news/alaska/story/9519289p-9429886c.html ("Walruses are vulnerable to stampedes when they gather in such large numbers. The appearance of a polar bear, a hunter or a low-flying airplane can send them rushing to the water."); see also FEIS at IV-76, 147, 148 (discussing acute and potentially lethal sensitivity to disturbance of walrus), (Dec. 14, 2007).

[clxxxi] Dan Joling, *Walruses crushed in routs*, Anchorage Daily News *available at* http://dwb.adn.com/front/story/9520313p-9430931c.html , (Dec. 15, 2007).

[clxxxii] FEIS IV- 148, 153.

[clxxxiii] FEIS IV-188.

[clxxxiv] Letter from Christine Reichgott, EPA to John Goll, MMS re Draft Environmental Impact Statement, at pages 5-6 (Dec. 27, 2006) (Dec. 2006 EPA letter). For a more through discussion of human health concerns from oil and gas activities see Alaska Inter-Tribal Council (AITC) Center for Health Impact Assessment, http://aitc.org/node/28 (visited Jan. 11, 2008).

[clxxxv] FEIS II-37.

[clxxxvi] FEIS II-37.

[clxxxvii] FEIS IV-157.

[clxxxviii] FEIS IV-211, 212.

[clxxxix] Letter from Robert Mecum, NMFS to John Goll, MMS re DEIS for Sale 193 at page 4 (Jan. 30, 2007) (Jan. 2007 NMFS letter).

[cxc] National Marine Fisheries Service Comments on Department of the Interior's Minerals Management Service (MMS) Draft Proposed Outer Continental Shelf (OCS) Oil and Gas Leasing Program 2007-2012 (April 10, 2006.)

[cxci] 2007-2012 FEIS Volume II, page V-25 (April 2007).

[cxcii] Letter from Robert Mecum, NMFS to John Goll, MMS re DEIS for Sale 193 at page 1 (Jan, 30, 2007) (Jan. 2007 NMFS letter).

[cxciii] Letter from Anne Norton Miller, EPA to James F. Bennett, MMS re 2007-2012 Outer Continental Shelf Oil and Gas Leasing Program (Nov. 22, 2006).

[cxciv] Letter from Christine Reichgott, EPA to John Goll, MMS re Draft Environmental Impact Statement, at page 6 (Dec. 27, 2006) (Dec. 2006 EPA letter).

[cxcv] Trustees for Alaska v. State, DNR, 865 P.2d 745, 748 (Alaska 1993) (Demarcation Point). Camden Bay I, 795 P.2d at 809 (noting that once initial approvals have been made, momentum toward development is very difficult to check); Trustees for Alaska v. Gorsuch, 835 P.2d 1239, 1246 & n. 6 (Alaska 1992).

[cxcvi] See Sierra Club v. Marsh, 872 F.2d 497, 504 (1st Cir. 1989) (noting the "difficulty of stopping a bureaucratic steam roller"). Trustees for Alaska the v. DNR 795 P.2d at 809 (noting that once initial approvals have been made, momentum toward development is very difficult to check); Trustees for Alaska v. Gorsuch, 835 P.2d 1239, 1246 & n. 6 (Alaska 1992).

[cxcvii] See www.mms.gov/alaska/lease/hlease/leasetable.htm. Anchorage Daily News. Oil industry abandons Bristol Bay. Page A1, (Aug 1, 1995).

[cxcviii] 35 Fed. Cl. 309 (U.S. Court of Federal Claims).

[cxcix] U.S. Department of the Interior. DOI Press Release. Landmark protections announced for fragile offshore resources. www.doi.gov/new/archives/8_2-1.html (July 31, 1995).

[cc] Kumins, L.C., Outer Continental Shelf leasing for oil and gas development, Congressional Research Service Report for Congress # 95155 www.ncseonline.org, (Nov. 1, 1996).

[cci] Oil industry abandons Bristol Bay, Anchorage Daily News (Aug. 1, 1995).

[ccii] USFWS, News Release, "U.S./Russia Polar Bear Treaty Enacted," http://www.fws.gov/news/newsreleases/showNews.cfm?newsId=38AFE641-927B-89AC-016B93A8F1F06F2C (Sep. 24, 2007).

[cciii] Accessible online at www.akenergyauthority.org

[cciv] Alaska Renewable Energy Atlas, Renewable Energy Alaska Project (July 2007), http://www.akenergyauthority.org/Reports%20and%20Presentations/EnergyAtlas2007.pdf (visited Dec. 6, 2007).

A summary of the Alaska Atlas is available on-line at http://rredc.nrel.gov/wind/pubs/atlas/chp3.html#alaska (visited December 6, 2007).)

[ccv] See http://www.yourownpower.com/

[ccvi] See Renewable Energy Atlas of the West http://www.energyatlas.org/ (visited Dec. 6, 2007). The Hewlett Foundation and The Energy Foundation sponsored the atlas, and the following organizations joined together to create it: the Land and Water Fund of the Rockies, Northwest Sustainable Energy for Economic Development, Green Info Network and Integral GIS. There is a wind resource atlas of the entire United States. See Wind Energy Atlas of the United States, http://rredc.nrel.gov/wind/pubs/atlas/chp1.html (visited Dec. 6, 2007).

The CHAIRMAN. We thank you so much, Ms. Williams. And our final witness is Ms. Jamie Rappaport Clark, the Executive Vice President of Defenders of Wildlife. She has spent 20 years in government service, primarily with the U.S. Fish and Wildlife Service, where she served as Director from 1997 to 2001. We thank you so much for being here. Whenever you are ready please begin.

STATEMENT OF JAMIE RAPPAPORT CLARK

Ms. CLARK. Thank you. Good morning, Mr. Chairman and members of the select committee. Thank you for inviting me to testify today.

This hearing today highlights the conflicted and misguided priorities of this current administration. On the one hand, the Bush administration continues to drag its feet protecting polar bears under the Endangered Species Act. On the other hand, it is rushing forward with its proposal to sell oil and gas leases under nearly 30 million acres in the Chukchi Sea in the heart of critically important polar bear habitat. At the very least this creates an appearance of once again allowing politics to trump science and endangered species decision making.

As the Chair mentioned, as a long-term career biologist with the Federal Government before becoming Director of the Fish and Wildlife Service, I know firsthand the challenges faced by the dedicated professionals implementing the Endangered Species Act. And consequently I am certainly reluctant to criticize them; however, I cannot ignore what this administration's political appointees have done to the administration of ESA and our other conservation laws. This administration has repeatedly engaged in political manipulation of science and conservation.

The Interior Department's own Inspector General exposed cases of inappropriate political interference with the professional assessments and recommendations of the Department's biologists, scientists and wildlife managers in endangered species listings and critical habitat determinations, decisions which the Department has now been forced to revisit at a significant cost to taxpayers.

Thus, when the administration delays listing while at the same time promoting new oil and gas leasing in critical polar bear habitat, it is reasonable, I believe, to suspect that it is once again putting political interest before conservation.

There are numerous factors that support listing polar bears under the Endangered Species Act. Above all known threats, however, is the unequivocal loss of polar bear habitat due to global warming. The polar bear's Arctic sea ice is literally melting away, as my colleagues just demonstrated. Interior's own scientists have concluded that if we continue business as usual there will be no wild polar bears left in the United States by 2050. Clearly, there is no scientific rationale for further delay. Polar bears should be listed immediately.

Once the Interior Department proposed to list polar bears the Minerals Management Service and Fish and Wildlife Service were obligated by law to determine whether oil and gas leasing in the Chukchi Sea is likely to jeopardize polar bears and, if so, to confer on the leasing and its impact. After polar bears are listed the agencies must consult under the ESA to ensure that the listing is not likely to jeopardize their continued existence. It would fly in the face of the precautionary approach to the Endangered Species Act if the Interior Department were able to take advantage of its own delay, its own delay in making a listing decision in order to expedite oil and gas leasing in the Chukchi Sea without fully evaluating the potential harm to polar bears. At a minimum the administration should delay any leasing in the Chukchi or any other polar bear habitat until the listing decision has been made and consultation requirements are fully met.

Ms. CLARK. The potential harm to polar bears from oil and gas leasing in the Chukchi Sea is substantial. Such development is highly risky and detrimental to polar bears and other Arctic wildlife. And most disturbing, there is no technology to respond to and clean up spilled oil at sea in conditions that are prevalent in the Arctic. The impact of promoting additional burning of fossil fuels will add further pressure to an already stressed polar bear population.

We cannot continue business as usual. The plight of the polar bears is a warning to all of us that we need to act now to reduce our use of fossil fuels.

In conclusion, the polar bears—the Bush administration should move forward immediately to list the polar bear and fully comply with the Endangered Species Act. The administration should also withdraw the proposed oil and gas leases in the Chukchi Sea and should refrain from any further leasing in polar bear habitat until adequate measures are in place to protect the polar bears in their habitat from the harmful effects of such development.

Most importantly, the administration should stop their foot dragging and work with the Congress to develop an energy policy that would reduce our use of fossil fuels and our production of greenhouse gas pollution. If we act now there is hope for the polar bears, the Arctic ecosystem, ourselves and our children.

Thank you, Mr. Chairman for the opportunity to testify and I am happy to respond to questions.

[The statement of Ms. Clark follows:]

TESTIMONY OF
JAMIE RAPPAPORT CLARK
EXECUTIVE VICE PRESIDENT
DEFENDERS OF WILDLIFE

BEFORE THE SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING
UNITED STATES HOUSE OF REPRESENTATIVES

HEARING ON
"ON THIN ICE: THE FUTURE OF THE POLAR BEAR"

JANUARY 17, 2008

Mister Chairman and Members of the Select Committee, I am Jamie Rappaport Clark, Executive Vice President of Defenders of Wildlife. Founded in 1947, Defenders of Wildlife has over 1 million members and supporters across the nation and is dedicated to the protection and restoration of native animals and plants in their natural communities.

Thank you for the opportunity to testify today. This hearing highlights the misguided and conflicting priorities of the current administration. There is a tragic irony to this discussion today to assess both the urgent importance of the proposal pending in the Department of the Interior to take action to prevent the extinction of the polar bear and the simultaneous proposal by the Minerals Management Service (MMS) in the same Interior Department to open to large-scale offshore oil and gas operations nearly 30 million acres of core habitat critical to the survival of polar bears. There is something dreadfully wrong with this picture.

On the one hand, it has to be abundantly clear to the Interior Department that global warming due to human activities threatens the survival of well documented, dwindling numbers of polar bears, and yet they are irresponsibly dragging their feet on listing polar bears as a threatened species under the Endangered Species Act.. On the other hand, the same Department is now irresponsibly and unnecessarily rushing forward to sell oil and gas leases in the Chukchi Sea, in the heart of critically important and essential polar bear habitat. Not only would leasing increase the risk to polar bears from oil spills, pollution, and habitat destruction and further disturb already stressed populations, but also it would lead to even more burning of fossil fuels and even greater emissions of greenhouse gas pollution, exacerbating global warming and the melting of polar bears' Arctic ice habitat.

Defenders of Wildlife strongly believes the administration is wrong on both counts. As we have stated in comments to the U.S. Fish and Wildlife Service (FWS) and as we reiterate here today, polar bears should be listed as a threatened species under the Endangered Species Act, without further delay. Furthermore, as a matter of law, once polar bears are listed, the administration must not proceed with any new oil and gas leasing in the Chukchi Sea or other areas of polar bear habitat until it has fully complied with the Endangered Species Act's consultation requirements to ensure that such leases will not jeopardize the continued existence of polar bears and other listed species. Consequently, it is the height of irresponsibility for the administration to try to evade consultation requirements by approving new oil and gas leasing in this region before polar bears are listed.

Mister Chairman, the administration's delay in listing polar bears on the one hand while, on the other hand, pushing forward with new oil and gas leasing in the heart of polar bear habitat, at the very least creates an appearance of, once again, allowing politics to trump science in endangered species decision-making. As a longtime career biologist with the federal government before becoming director of FWS, I know the difficulties faced by the dedicated professionals in FWS, the National Marine Fisheries Service, and other federal agencies implementing the Endangered Species Act. Consequently, I am reluctant to criticize them. However, I cannot ignore what this administration's political appointees have done to the administration of the Endangered Species Act and our other conservation laws. This administration has repeatedly engaged in political manipulation of science and conservation. For example, former Deputy Assistant Secretary of the Interior Julie McDonald was found by the Interior Department's own Inspector General to have inappropriately interfered politically with the professional assessments, conclusions, and recommendations of the Department's biologists, scientists, and wildlife managers in endangered species listing and critical habitat decisions--decisions which the Department has now been forced to revisit. Moreover, this administration has consistently starved endangered species and other conservation programs, reducing staff and budget to untenable levels. Thus, when the administration delays listing polar bears under the Endangered Species Act while, at the same time, promoting new oil and gas leasing in polar bear habitat, it is reasonable to suspect that it is once again putting political interests before conservation. For this reason, Defenders of Wildlife welcomes today's hearing and urges you and Members of the Select Committee to make clear that such political interference with conservation will not be tolerated, in the Arctic or elsewhere.

Defenders of Wildlife has been particularly concerned with the Arctic and the fate of polar bears. The Arctic has become "ground zero" for the most visible adverse early effects of global warming, a place where dramatic coastal erosion threatens human communities and where the accelerating disappearance of sea ice has become emblematic of the underlying problems directly attributable to our society's destructive dependence on carbon-based fossil fuels. Polar bears are the most visible, and most poignant, symbol of the devastating impact global warming is already having on wildlife. It is no accident that the world's leading soft drink seller, Coca-Cola, has adopted polar bears as a marketing image. People respond to these magnificent creatures. Thus, as reports of melting Arctic sea ice proliferate and images of polar bears starving or drowning find their way into the public consciousness, polar bears are awakening us all to the threat from global warming. Or almost all of us.

Unfortunately, there is still ongoing denial by the Bush administration. By continuing to delay listing polar bears as threatened, and at the same time pushing forward new oil and gas leases in essential polar bear habitat, the Bush administration is continuing its outrageous pattern of denial and foot-dragging in response to global warming, while actually promoting the burning of fossil fuels that will only make the problem worse -- for wildlife and humans.

Quite simply, Mister Chairman, it is past time for this administration to list polar bears as a threatened species, to follow the requirements of the Endangered Species Act and carefully review proposed oil and gas leases and other federal actions to ensure that they will not jeopardize the continued existence of polar bears, and to refrain from any new oil and gas leasing in the Chukchi Sea and other polar bear habitat until adequate measures are in place to prevent harm from such activity to polar bears and their habitat. If the administration will finally show responsible leadership, the polar bear can serve not just as a symbol of the harmful impacts of global warming, but as a beacon of hope for helping all wildlife survive global warming.

I. Polar Bears Should Be Listed as Threatened Under the Endangered Species Act, Without Further Delay.

Responding to a petition filed by the Center for Biological Diversity, Greenpeace, and the Natural Resources Defense Council, FWS has proposed listing polar bears as a threatened species. FWS has received more than 600,000 comments on the proposal, nearly all of which favor listing. Defenders of Wildlife submitted comments in support of the proposed listing, in April 2006 and October 2007.

As we have stated in our comments on the proposed listing, there are numerous factors that support listing polar bears as threatened. These include the continued hunting of polar bears and international trade in polar bear parts, potential for increased vulnerability to disease and parasites resulting from habitat shifts due to global warming, increased exposure to human-caused disturbance and pollution, and the inadequacy of existing regulatory mechanisms to respond to the threat from global warming. Above all other factors contributing to the need to list polar bears as threatened, however, is the unequivocal and extensive loss of polar bear habitat due to global warming.

The Arctic sea ice which provides habitat for polar bears is literally melting away. Research conducted by experts at the U.S. National Snow and Ice Data Center in Colorado shows that for the second year in a row Arctic sea ice has failed to re-form after the summer melt. Last September, satellite images showed Arctic ice cover to be at its lowest extent since monitoring began in 1978, a reduction of 8.7 percent per decade. Scientists confirmed that summer sea ice retreated even more during summer 2007.

The extent of sea ice on the Arctic Ocean, of course, fluctuates with the season. The ice melts during the six months of daylight, reaching its minimum point in September. Normally, during the winter, sea ice forms to compensate for what was lost over the summer, but last winter the Arctic experienced warmer than usual temperatures preventing ice from forming and causing the ice that did form to be thinner. Reduction of the extent of sea ice in both the winter and summer is an indicator that the Arctic is experiencing a positive feedback effect, whereby warmer temperatures melt sea ice, causing more open water that absorbs sunlight, which, in turn, causes more ice to melt. In addition, emissions of black carbon, or soot, also may be accelerating the melting of sea ice by reducing its reflectivity. If this cycle continues as predicted, models indicate that there will be no sea ice left by 2070, or earlier. Already parts of the Arctic Ocean remain ice-free year round, such as a large area in the Barents Sea, home to an estimated 2,000-5,000 polar bears.

Loss of sea ice results in dire consequences for polar bears. Sea ice provides a platform from which polar bears hunt for ringed seals and other prey. As seals follow the receding sea ice, they may be too far from land for polar bears to reach them. Polar bears, though good swimmers over short distances, are not able to traverse large open expanses of water. In 2004, MMS found four bears that had drowned off the northern coast of Alaska where the ice cap had retreated 160 miles north of land. Unable to reach the sea ice, polar bears that remain on land will likely come into conflict with humans, leading to killing of so-called nuisance bears.

In particular, lack of sea ice will have a negative impact on female bears. MMS has found that, in the last ten years, 60 percent of female polar bears were denning on land and 40 percent were denning on ice, where previously the percentages were reversed. Polar bears that den on land have more difficulty traveling between land and ice, forcing them to leave the ice and stop hunting earlier before the ice has retreated too far for them to find their preferred denning areas on land. Less and thinner ice may also disrupt the rearing of polar bear cubs for those populations that den on the ice.

Here is the most dire warning of all: Reductions in Arctic sea ice and increases in the rate at which Arctic sea ice is disappearing led the U.S. Geological Survey to conclude that U.S. populations of polar bears will be extirpated by 2050. The government's own scientists predict that, if we continue with business as usual in emitting greenhouse gas pollution, by mid-century, polar bears will no longer exist in Alaska. **Case closed.** Polar bears must be listed as threatened under the Endangered Species Act. In addition, immediate steps must be taken to halt their downward spiral. These include refraining from oil and gas leasing in the Chukchi Sea and changing our energy policy to reduce greenhouse gas pollution. If we act now, there is hope for polar bears, the Arctic ecosystem, and ourselves and our children.

II. The Bush Administration Should Refrain From Oil and Gas Leasing in the Chukchi Sea and Any Other Polar Bear Habitat Until It Has Fully Complied With the Endangered Species Act to Protect Polar Bears and Their Habitat

Once a species is listed under the Endangered Species Act, it is entitled to a number of important protections. First, it is illegal for anyone to take an individual of the species. Take means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19). Prohibited take includes habitat destruction which actually kills or injures individuals of a listed species. So, for example, oil and gas development in the Chukchi Sea which results in an oil spill that kills or injures polar bears would be an illegal take under the Endangered Species Act, unless incidental take has been authorized pursuant to Section 7 of the Act.

In addition to the prohibition against take, listed species receive the additional protection provided by the consultation requirements of Section 7 of the Endangered Species Act. Section 7 requires federal agencies to consult with either the Secretary of the Interior, acting through FWS, or, in the case of certain marine species, the Secretary of Commerce acting through the National Marine Fisheries Service, to ensure that any action "authorized, funded, or carried out" by a federal agency "is not likely to jeopardize the continued existence" of a listed species or adversely modify or destroy its designated critical habitat. 16 U.S.C. § 1536(a)(2). Consequently, once polar bears are listed, any proposed oil and gas leases in the Chukchi Sea or other polar bear habitat would have to undergo Section

7 consultation first, to ensure that the leases are not likely to jeopardize the continued existence of polar bears or any other listed species in the region.

Even before polar bears are listed, Section 7 requires federal agencies to confer with FWS on possible impacts of federal actions which are likely to jeopardize polar bears or any other species proposed for listing. 16 U.S.C. § 1536(a)(4). Thus, since listing of polar bears has been proposed, MMS and FWS must determine whether oil and gas leasing in the Chukchi Sea is likely to jeopardize polar bears and, if so, confer on the leasing and its impacts. Once polar bears are listed, MMS must consult with FWS to ensure that the leasing is not likely to jeopardize the continued existence of polar bears. In other words, the Endangered Species Act requires federal agencies to stop and think about the effect of their actions on listed species and species proposed to be listed. It would fly in the face of the precautionary purpose of the Endangered Species Act if the Interior Department is able to take advantage of its own delay in making a listing decision on polar bears to expedite oil and gas leasing in the Chukchi Sea, without first fully evaluating the potential harm to polar bears. At minimum, given the proximity of the listing decision and the leasing proposal, the Bush administration should delay any oil and gas leasing in the Chukchi Sea or any other polar bear habitat until the listing decision has been made and, assuming polar bears are listed, Section 7 consultation requirements are fully met.

The potential for harm to polar bears from oil and gas leasing in the Chukchi Sea is substantial. MMS is proposing to open nearly 30 million acres of core habitat critical to the survival of polar bears to oil and gas development. Such development is highly risky and detrimental to polar bears and other Arctic wildlife. Oil and gas development routinely produces massive air pollution emissions, including increased emissions of greenhouse gases that cause global warming. The sensitive Arctic marine environment is subject to serious damage, from activities ranging from seismic survey blasts to routine toxic discharges of spent drill muds, borehole cuttings, and wastewater, dumped directly into one of the most pristine and biologically sensitive marine environments on the planet. The risk of damage from oil spills, leaks, fires, and other accidents, exacerbated by an industry history of lax oversight and enforcement, poses a serious threat to Arctic wildlife.

Most disturbing of all, no technology presently exists that can even begin to successfully clean up spilled oil at sea in the meteorological and sea-state conditions prevalent in the Arctic. Furthermore, no oil spill technology currently exists to adequately respond to a spill in broken-sea-ice conditions such as those prevailing in the Chukchi Sea. Once an oil spill moves under the ice sheet, which is essential to the breeding, feeding, and sheltering of polar bears and the entire Arctic marine life community, there is no way to even track its movements. Oil will not biodegrade but will remain highly toxic for up to a century or more, continually leaking out at unpredictable intervals to poison our wildlife and foul delicate lagoons and hundreds of miles of inaccessible shorelines. For polar bears, as well as the resident walrus and shorebird populations, and for tbe migrating bowhead and beluga whales in the Chukchi Sea, the consequences are unthinkable.

In addition to the potential for direct harm to polar bears and their habitat from oil and gas development in the Chukchi Sea and elsewhere, there is the indirect, but equally devastating, impact of promoting additional burning of fossil fuels, which increases greenhouse gas pollution that causes global warming. We have reached a point, Mister Chairman, where we cannot continue business as usual. We cannot continue to promote the burning of fossil fuels if we are going to stabilize atmospheric greenhouse gas concentrations and stop human-caused global warming. The plight of polar bears is a warning to us that we must act now to reduce our use of fossil fuels and consequent production of greenhouse gas pollution.

This is so much bigger than a singular focus on the polar bear, regardless of the importance of this species itself. Given what we now clearly know about the drastic implications of global warming for human society worldwide, it is clear that the administration's stumbling approach to making these decisions concerning the polar bear and the Chukchi Sea are emblematic of something bigger and very troubling. Even with all the evidence out there on the seriousness of global warming, this administration still—incomprehensibly—refuses to believe it. Or, they do believe it and yet still will not take responsible action because of their commitment to serve private and political interests that are not in the best interests of the country or the future. Either way, it is a poor reflection on this administration and the American people are ill-served by it.

Conclusion

In conclusion, Mister Chairman, we have come to a crossroads--for the polar bear, for all life in the Arctic seas, and for our own global climate future. It is long past time to begin seriously addressing global warming. The Bush administration should move forward immediately to list the polar bear as a threatened species and to fully comply with the requirements of the Endangered Species Act. The administration should also withdraw the proposed oil and gas leases in the Chukchi Sea, while it fully complies with the consultation requirements of the Endangered Species Act. The administration should also refrain from any further oil and gas leasing in the Chukchi Sea or other polar bear habitat until adequate measures are in place to protect polar bears and their habitat from the harmful effects of such development. Most importantly, this administration or, more likely, the next one, should work with the Congress to develop an energy policy that will reduce our use of fossil fuels, our production of greenhouse gas pollution, and that will protect polar bears, other imperiled wildlife, and, ultimately, ourselves and future generations from the harmful impacts of global warming.

Thank you again for the opportunity to testify on this important issue. I will be happy to answer any questions you may have.

The CHAIRMAN. Thank you. The Chair recognizes himself for a round of questions.

Ms. Clark, you support delaying the decision on the leasing in the Chukchi Sea until there is a decision made on the listing of the polar bear?

Ms. CLARK. Absolutely, Mr. Chairman, it just makes common sense.

The CHAIRMAN. Now, when you had the job of running the Fish and Wildlife Service, would you have made a recommendation to the Secretary of Interior to make that decision?

Ms. CLARK. Unequivocally, yes.

The CHAIRMAN. You would have. And would it be appropriate for you to make a recommendation to the Secretary?

Ms. CLARK. Yes.

The CHAIRMAN. And so Secretary Babbitt did welcome those kinds of recommendations?

Ms. CLARK. Yes, he did.

The CHAIRMAN. Okay, great. Thank you, that is helpful, because again, Secretary Kempthorne obviously has a huge decision to make here. Does he have it within his power to rectify this problem?

Ms. CLARK. Yes, he does, Mr. Chairman. On the one hand he has an obvious statutory responsibility to make a decision based on the best science available, whether or not the polar bear deserves the protection of the Endangered Species Act. On the other hand, he has a somewhat discretionary decision on timing of oil and gas leasing in the Chukchi, very different decisions.

The CHAIRMAN. But decisions within his——

Ms. CLARK. Both within his purview, absolutely.

The CHAIRMAN. I think that is important for the public to know.

Ms. CLARK. Yes.

The CHAIRMAN. Ms. Williams, you are testifying to the fact that there are still gaps of knowledge that exist——

Ms. WILLIAMS. It is virtually——

The CHAIRMAN. Between what is going on in the ice melt and its impact on polar bears. Could you expand on that?

Ms. WILLIAMS. Yes. The gaps in knowledge represent a virtual black hole. As I had mentioned, we don't know how many polar bears there are there. We don't know their condition, we don't know their distribution. We don't know how the recent melting which you saw so dramatic in this area is affecting them. We do not know other than we believe from previous research that a spill would be lethal, but we don't know the precise—traveling of that spill and so forth.

And so we do know, though, that we have no technology to clean up oil in broken ice that has been proven, we do know it is lethal. And so what we know all speaks in favor very much of your legislation, what we don't know also speaks in favor of your legislation.

The CHAIRMAN. We thank you, Ms. Williams.

Ms. Siegel, you heard what Ms. Clark and Ms. Williams said both about the decision that Secretary Kempthorne can make in those gaps in knowledge that exist. Would you like to expand upon either one of those thoughts?

Ms. SIEGEL. Thank you, Mr. Chairman. I believe that there are many reasons that Chukchi Sea lease sale 193 should not go forward, but the fact that the polar bear has not yet been listed and that the process has now dragged on for nearly 3 years when it was supposed to be completed within 2 years is reason enough to halt this sale.

The CHAIRMAN. I think that is absolutely all we really have to know, that there is a year delay already in protection of the polar bear, but no time can be lost in the leasing of oil and gas drilling in the area where the polar bear lives and has to have a habitat if it is to survive. So that is the equation and we have to ensure that the Secretary of Interior makes the right decision or the Congress makes it for him.

Ms. CLARK. Mr. Markey, if I could add, I think, in listening to the testimony one of the most significant revelations as I was listening to it relates to what the decision is that has to be made. The decision by the Secretary and the Director regarding the polar bear needs to be made based on the best scientific information available. They seem to be trying to solve the cause of endangerment before making the call that its endangered. The Endangered Species Act does not call for that. It calls for a decision to be made on the biological status of the species at this time and all the kind of initiatives, innovations, other opportunities governing recovery will take over after that, but they are not going to solve the problem without declaring it.

The CHAIRMAN. Okay, thank you, Ms. Clark, that is very helpful. I think I will include that in my—in the language which I use to accompany the legislation as I am introducing it. I think that is very helpful. My time has expired.

Let me now turn and recognize the gentleman from Missouri. The gentleman is the last questioner I believe, unless another member returns. So I am going to recognize the gentleman and ask him then to adjourn the hearing if he would or if another member arrives, to please give the gavel to him. So with that, I recognize the gentleman from Missouri.

Mr. CLEAVER. Thank you, Mr. Chairman. It does not happen often that I am in full agreement with our witnesses, but I am today. But because I didn't get clear answers with the previous panel. I am interested, Ms. Clark, if you could give us a picture of how the machinery of the U.S. Fish and Wildlife Service actually functions with regard to the professional staff and then those who are appointed. My question that I asked earlier, which may be answered in the next millennium, is I was interested in whether or not there is political interference. And number 1, is it the normal process that the professional staff, the experts, the scientists collect information, make recommendations then to the Director and then those recommendations are acted on; is that the normal process?

Ms. CLARK. I can share with you how it used to work. I was a long time endangered species biologist before accepting the Presidential appointment as director. During that time, you are right, in that as director, I relied very heavily on the professional staff. They are highly competent, incredibly dedicated and very capable. And they would conduct all the science and all the kind of analytics. They are closest to the ground, closest to the species and certainly the most knowledgeable about the scientific effects.

They would then make a recommendation that would be moved through the regional office and into Washington. The responsibility of those of us in Washington were to review the science and ensure that it complied with the policy and statutory requirements of, in this case, the Endangered Species Act.

While certainly there is the opportunity for the policy makers political appointees to come up with a result with a different conclusion than the recommendation of the scientists and biologists, it was absolutely unheard of that the policy makers would change the underlying science.

Ms. SIEGEL. Congressman Cleaver, if I might elaborate a little bit. Over the past seven years, the Bush administration has essentially shutdown the listing program for Endangered Species. This administration has listed fewer species than any administration in history and it is not because of a lack of worthy candidates.

Overall, there are 279 species that are official candidates and have been waiting an average of 19 years for protection. Secretary Kempthorne has gone 617 days without listing a single species under the Endangered Species Act. The second longest delay in history was in 1981 when then Secretary of the Interior, James Watt, went 182 days without listing a species. In that situation, Congress quickly amended the Act to include the strict statutory deadlines for listing species that we now have.

We have repeatedly seen political appointees in this administration use delays such as the current delay with the polar bear listing to interfere with the conclusions of service biologists. One example from a similar situation concerns a species called the California tiger salamander. The service was under a court order to issue a final listing decision for this species and asked the court for more time. This time was then used by the political appointee to overrule the judgment of agency scientists. The court later ruled that a request or a delay had been used to illegally reduce protection for that species.

Under investigation by Congress and the Inspector General, the service has admitted to political interference in seven listing decisions which involved former Assistant Secretary Julie MacDonald, but has it not actually committed to correcting this interference. And the Center For Biological Diversity has found evidence of political interference an additional 55 Endangered Species Act listing decisions that the agency has refused to address. And this is why we are so concerned with the current delay in the listing decision for the polar bear.

Mr. CLEAVER. I think there is unanimity, at least on this side, that we do need to act and that the delay is unfortunately politically motivated. We have seen reports from staff bleached in other areas of our government over the past few years. And so it will not be a shock to see it happen here.

Ms. Williams, my final question. How far can polar bears swim?

Ms. WILLIAMS. They can swim long distances. Part of it depends on the conditions, but it is important to note that when polar bears swim, they use a lot of energy. They are really designed to swim from iceberg to iceberg or short distances where there is no ice.

They are not designed to swim 500 miles, which some of the projections show the ice will be 500 miles offshore, and polar bears will have the great challenge of swimming 500 miles from the edge of the ice to come on land to den.

What we found, and it was actually MMS scientists have found that with diminished ice several years ago, there was a storm and they found more and more polar bears in the water as opposed on ice, because there is less ice. And it was those MMS scientists who found the drowned polar bears. And polar bears were drowned after that storm because they didn't have enough ice to rest on and to seek refuge on.

So polar bears can drown when they have too far to swim. They can use too much energy when they have too far to swim, it can affect their denning activities and other activities. So polar bears again were designed to be on ice not swimming in water except for short distances. So the more the ice retreats, the worse it is for polar bears. And of course, polar bears swimming through oil, as we know from a study that was done by a Canadian scientists, is lethal.

Mr. CLEAVER. I am going to turn this over to Mr. Inslee. I was trying to make a point earlier and perhaps I didn't make it as— yes, I did, it was clear. When we talk about cleanup of an oil spill, we are not talking about reversing the impact completely of that oil spill. And I was trying to point out that after the USS *Arizona* was damaged and went under, that 60 years later, it is still leaking oil. If you went there today, you would see oil bubbling up.

Ms. WILLIAMS. Mr. Cleaver, if I may respond to that, one of my jobs when I was special assistant was to serve on the Exxon Valdez trustee council. And as you know, the Exxon Valdez oil spill occurred almost 19 years ago. There is still dramatic oil residues and release from that spill today.

We also know from Exxon *Valdez* the spill cleanup process failed. When you combine what we see from spills throughout the Nation in the world and the failure of spill cleanup to begin with, the long residual life of oil spills. And when you combine that with the Chukchi Sea, which is the worst possible conditions for even trying to spill ice. Imagine that you just have this big tub filled with ice cubes and you pour oil in there, how are you going to get the oil out between the ice cubes?

Various demonstration projects have been tried and they have failed, and even under the best of circumstances, to clean up that oil in those conditions. So we have a triple-whammy condition in the Chukchi Sea, it could not be worse for polar bears with respect to spills. We have established that the likelihood of a major oil spill is 33 to 51 percent.

Mr. CLEAVER. Thank you very kindly. Mr. Inslee.

Mr. INSLEE. I thank you. Before I forget, I want to enter into the record the environmental impact statement that I was referring to in my previous questions.

This planned sequence of events to allow this leasing before this designation makes me harken back. I am real glad that we did not allow DDT before we had the designation of the bald eagle. I saw four of them sitting on pylons outside of where I live the other day and I think it would be a similar type of tragedy, so I appreciate your working here.

I want to ask you about hunting issues. Hunting of polar bears now is prohibited by the Marine Mammal Protection Act, but it is allowed for people who go out and hunt in Canada and bring them back as trophies. I am told there is some significant decline going on in the Hudson Bay polar bear population. If there is a designation, how would it effect that loophole? Could the Agency close that loophole or would it require statutory action?

Ms. SIEGEL. Thank you, Congressman Inslee. When a species is listed as threatened or endangered under the Endangered Species Act, it is automatically designated as depleted under the Marine Mammal Protection Act. Under normal circumstances, species that are designated and depleted under the Marine Mammal Protection Act are not eligible for the approval of sport-hunted trophies from Canada. So it is possible that if the polar bear is listed under the Endangered Species Act, that importation of sport hunted polar bear trophies from Canada will no longer be possible.

I would note, however, that Director Hall at the press conference last week when he announced a delay on the listing decision did also note that it might be possible to apply for an exemption from this process from the Marine Mammal Commission.

Mr. INSLEE. And what is the science to date about the decline of the Hudson species, whether it is related to global warming or hunting or both or other reasons? Can you give us any insight on that?

Ms. SIEGEL. Scientists have attributed the decline of the western Hudson Bay population to global warming and also to the harvest of approximately 40 bears each year from that population, which at some point during this kind of species ceased to be sustainable.

Mr. INSLEE. Great. Going back to this listing decision and how it affects the leasing. We have talked a lot about the danger of oil spills and the 33 to 51 percent likelihood of a spill and the potential mortality. But there is another huge sort of elephant in the room, if you will, and that is the CO_2 associated with burning the oil that we drill. And that is really the ultimate potential mortality of the species of CO_2 coming out of the oil we burn and we drill, going in the atmosphere, heating the atmosphere, melting the ice cap. By the way, someone said it is only a 20 percent reduction, that is way, way off. Could you explain why that is way off, Ms. Williams?

Ms. WILLIAMS. That is way off. Indeed the 20 percent is incorrect. The reduction that we have experienced is 10 percent per year since the 1970s. And essentially the minimum that we experienced last summer in 2007 was 23 percent less than the previous minimum, but it was essentially 40 percent less than the average between the 70s and currently, but it has been 10 percent per year since the 1970s.

Mr. INSLEE. Do I understand there is both a reduction in the area covered to the extent that in a very short period of time, either a decade or shortly thereafter, there will be no summer ice by area, but there is also about a 40 percent reduction on the average depth of the ice, it is pretty much across its range.

Ms. WILLIAMS. That is correct, Mr. Inslee. And one thing useful, I think the committee members know, but perhaps for the public to understand better, right now the average depth of the Arctic ice cap is only 3 feet. If you walked up to an average person and said, how thick do you think the Arctic ice cap is over the North Pole? They would say 100 feet, 200 feet, right? It is only 3 feet. And that has diminished by 40 to 50 percent in the last several decades. And so we are talking about a very fragile habitat, ice that is on average only 3 feet thick. That is why global warming has had such a profound effect on it.

Mr. INSLEE. So if the polar bear is listed, would it be appropriate in any leasing decision, including this one, to consider the CO_2 emissions and their capability to further this acceleration and the decline of the Arctic sea ice?

Ms. CLARK. Section 7, the consultation provision that the administration seemingly is trying to escape, would require the evaluation, the analysis of not only the direct and indirect effects of the proposed actions, but the interrelated and interdependent effects. And so in that light, there would be a much more comprehensive review and analysis of the impacts of the threats affecting the polar bears than would ever occur under the Marine Mammal Protection Act or any inner agency conferencing under a proposed species listing.

Mr. INSLEE. Very well. Our time has expired and I want to thank the witnesses, all of the witness, both panels, it has been very educational. We are, at least many of us on this panel, are hopeful that this will help inspire the administration and the Secretary to take another look at this issue. And I will be joining Mr. Markey in introducing legislation today, should that not take place by revisiting by the administration to do this by legislature or otherwise. And I have, of course, been joined by 2 dozen of my colleagues in a letter to the Secretary urging him to revisit this, what we believe to be a very ill-considered decision. With that, having received the gavel, we will consider this hearing concluded.

[Whereupon, at 11:53 a.m., the committee was adjourned.]

CENTER *for* BIOLOGICAL DIVERSITY
Because life is good

Response of Kassie Siegel
Climate, Air, and Energy Program Director
Center for Biological Diversity

To March 27, 2008 Follow-up Questions from the U.S. House of Representatives Select Committee on Energy Independence and Global Warming on its

January 17, 2008 Hearing:
On Thin Ice: The Future of the Polar Bear

1) Leaders of Canada's Arctic Inuit people denounced US environmentalists on Monday for pushing Washington to declare the polar bear a threatened species, saying the move was unnecessary and would hurt the local economy. I see Native Americans as conservationists and responsible stewards of the environment. How do you respond to their concerns?

Some Arctic residents and organizations support Endangered Species Act listing for polar bears, while others have expressed concerns or opposed the listing. The opposition has come from groups and individuals that fear that after the polar bear is listed under the Endangered Species Act, the U.S. Fish and Wildlife Service will no longer allow the importation of trophy hunted polar bear parts into the United States. These groups are concerned about the potential loss of fees paid by U.S. trophy hunters to local hunting guides, as these fees are an important source of income for some individuals and communities.

Indigenous residents of the Arctic are suffering some of the earliest and most intense impacts from global warming. Potential loss of income from polar bear trophy hunting because polar bears are now threatened with extinction due to global warming is only one example among so many ongoing impacts. It is important to address these concerns. The U.S. and Canadian governments should be doing much more to help communities in the Arctic and elsewhere cope with the devastating economic, health, social, and other impacts of climate change.

Protecting the polar bear under the Endangered Species Act is a critically important first step in saving the species from extinction, addressing global warming, and slowing the rate of the Arctic meltdown. The listing should move forward, and the U.S. and Canadian governments should also provide assistance to help communities and individuals pursue sustainable economic development. For example, an increase in tourism to view and photograph polar bears and other animals could replace income from trophy hunting, if the resources for conducting non-trophy hunting tourism were further developed.

2) Polar bears have survived other warming periods in the last 10,000 years. Do you have any scientific reason to believe that polar bears cannot adapt to some level of climate change? Do we know with any certainty what that threshold is?

The period from 10,000 years ago to the beginning of the Industrial Revolution is known as the Holocene and is characterized by a relatively stable climate during which our own human civilization has flourished. The period from the Industrial Revolution to today is known as the Anthropocene because human caused greenhouse emissions are now warming our climate. While there has been some warming and cooling during the Holocene, polar bears have not experienced any warming period in the past 10,000 years comparable to what we will experience in the next century and beyond if greenhouse gas pollution is not curtailed. Polar bears cannot survive this level of warming, as demonstrated multiple studies discussed at length in my written testimony at pp. 3-12.

3) Isn't it possible that when conducting a census of polar bears that we could be witnessing a shift in habitat use rather than a significant change in actual population?

As previously predicted by scientists, we are currently seeing both a shift in polar bear habitat use in some areas and a decline in some polar bear populations. For example, as the sea ice retreats further from land in the summer, polar bears that would previously stay with the sea ice are increasingly becoming stranded on land. In some circumstances this may lead some local residents to feel that polar bear populations are increasing, however, there is no scientific evidence for this conclusion. In fact, a recent study has demonstrated that increased sightings of polar bears on land in Canada is at lease partially the result of earlier sea ice break-up, not increased numbers of polar bears.[1]

4) With a high demand for oil for the foreseeable future and since you want to limit the amount of oil that America can recover from domestic sources of production, do you believe it is in our nation's interests to continue to rely on foreign sources of oil? Wouldn't better policy consist of cultivating domestic sources while developing new technology that will rely less on oil?

The United States should certainly not continue to rely upon foreign oil imports. The good news is that the solutions to global warming – things like increased energy efficiency, fuel economy, and use of renewable energy, as well as changing land use and transportation patterns, will promote our energy independence, as well as improve our quality of life and benefit our economy. On the other hand, we cannot drill our way to energy independence. We can and must protect our nation's air, land, water, and wildlife from further fossil fuel development while simultaneously increasing energy efficiency, decreasing energy demand, and providing new sources of clean, renewable power.

---

[1] Stirling, I. and C. Parkinson. 2006. Possible effects of climate warming on selected populations of polar bears (*Ursus maritimus*) in the Canadian Arctic. *Arctic* 59: 261-275.

5) You note that as early as 1972, scientists have said that the polar bear could be adversely affected by global warming, yet hasn't the number of polar bears has increased enormously since 1972?

Uncontrolled hunting of polar bears in the 1950s and 1960s led to near extinction of the species. After hunting was addressed by the International Agreement on the Conservation of Polar Bears and Their Habitat in 1973, many polar bear populations began the long process of recovery from that overhunting. The recovery of polar bear populations from overhunting is separate from the impacts from global warming that are now occurring. It is also incorrect to simply assert that polar bear populations are increasing. In its 2006 report, the Polar Bear Specialist Group ("PBSG") classified five of the world's 19 polar bear populations as declining, six as data deficient, five as stable, and only two as still increasing after severe overhunting in the past.[2] Furthermore, multiple lines of evidence indicate that some if not all of the populations classified as data deficient are also declining.

6) Other than pushing global warming legislation, have you done anything with the international community to help conserve the polar bear population or promote research where it is needed?

Yes. To save the polar bear, we must list it under the Endangered Species Act, swiftly reduce greenhouse pollutants including carbon dioxide, methane, and black carbon, protect the polar bear and its habitat from impacts such as oil spills and increased shipping in the Arctic, and institute an international protection regime for the region. Please see our report, *Not Too Late to Save the Polar Bear: A Rapid Action Plan to Address the Arctic Meltdown*[3] for further details. The Center for Biological Diversity engages with the international community in a number of forums, including as a non-governmental observer organization to the United Nations Framework on Convention on Climate Change.

7) ESA Section 9 prohibitions apply far more broadly, reaching the actions of private entities and corporations. Section 9 prohibits the "take" of listed species, which includes "harming" and "harassing" members of the species in addition to simply killing them directly. Both the legislative history and case law support "the broadest possible" reading of "take." Do you support Section 9 of the ESA to be applied to greenhouse gases?

We believe that global warming is causing "take" of polar bears. The cause of global warming is greenhouse emissions. Therefore any sufficiently large emitter of greenhouse pollution is potentially liable for such take, just as they would be for emissions of any other substance that poisons our land, air, or water to such an extent to cause take of a listed species. Take of listed species otherwise prohibited by Section 9 can be permitted through Section 10 of the Act if the impacts are minimized and mitigated to the maximum extent practicable.

---

[2] Aars, J., N.J. Lunn, and A.E. Derocher. 2006. *Polar Bears: Proceedings of the 14th Working Meeting of the IUCN/SSC Polar Bear Specialist Group, 20-24 June 2005, Seattle, Washington, USA*, at 44. IUCN, Gland, Switzerland and Cambridge, UK.

[3] Available at http://www.biologicaldiversity.org/publications/papers/ArcticMeltdown.pdf

Response of Deborah L. Williams
President, Alaska Conservation Solutions

To April 7, 2008 Follow-up Questions
from the Select Committee on Energy Independence and Global Warming regarding
the January 17, 2008 Hearing:
"On Thin Ice: The Future of the Polar Bear "
Submitted: April 28, 2008

1) Leaders of Canada's Arctic Inuit people denounced US environmentalists on Monday for pushing Washington to declare the polar bear a threatened species, saying the move was unnecessary and would hurt the local economy. I see Native Americans as conservationists and responsible stewards of the environment. How do you respond to their concerns?

According to the authoritative Arctic Climate Impact Assessment: "the Arctic is becoming an environment at risk... sea ice is less stable, unusual weather patterns are occurring, vegetation cover is changing, and particular animals are no longer found in traditional hunting areas during specific seasons"; furthermore, "local landscapes, seascapes, and icescapes are becoming unfamiliar, making people feel like strangers in their own land." (ACIA, 2004)

Because the Arctic has warmed so significantly, indigenous residents are suffering some of the earliest and most intense impacts from climate change. As Kassie Siegel stated in her answer to this question, "Potential loss of income from polar bear trophy hunting because polar bears are now threatened with extinction due to global warming is only one example among so many ongoing impacts. It is important to address these concerns. The U.S. and Canadian governments should be doing much more to help communities in the Arctic and elsewhere cope with the devastating economic, health, social, and other impacts of climate change."

I also concur with Ms. Siegel's answer when she states, "Protecting the polar bear under the Endangered Species Act is a critically important first step in saving the species from extinction, addressing global warming, and slowing the rate of the Arctic meltdown. The listing should move forward, and the U.S. and Canadian governments should also provide assistance to help communities and individuals pursue sustainable economic development."

I have traveled throughout Alaska and spoken with thousands of Arctic indigenous peoples. There is a tremendous level of concern about global warming and the damage it is inflicting on subsistence activities, cultures, the environment, fish, wildlife, youth and elders.

We have a moral obligation to address the cause of climate change using all appropriate legislative and other tools, while assisting indigenous peoples with the impacts.

2) Polar bears have survived other warming periods in the last 10,000 years. Do you have any scientific reason to believe that polar bears cannot adapt to some level of climate change? Do we know with any certainty what that threshold is?

I concur with Kassie Siegel's response to this question as follows: "While there has been some warming and cooling during the Holocene, polar bears have not experienced any warming period in the past 10,000 years comparable to what we will experience in the next century and beyond if greenhouse gas pollution is not curtailed. Polar bears cannot survive this level of warming, as demonstrated multiple studies discussed at length in [Ms. Siegel's] written testimony at pp. 3-12."

Indeed, the US Fish and Wildlife Service presented a persuasive answer to this question in their thoughtful, thorough and compelling summary of the scientific evidence, as set forth in the January 9, 2007, "12-Month Petition Finding and Proposed Rule to List the Polar Bear (*Ursus maritimus*) as Threatened Throughout Its Range." As noted in the summary to that proposed rule, "After review of all available scientific and commercial information, we [the USFWS] find that listing the polar bear as a threatened species under the Act is warranted."

3) Isn't it possible that when conducting a census of polar bears that we could be witnessing a shift in habitat use rather than a significant change in actual population?

Again, I concur with Kassie Siegel's answer to these questions as follows: "As previously predicted by scientists, we are currently seeing both a shift in polar bear habitat use in some areas and a decline in some polar bear populations. For example, as the sea ice retreats further from land in the summer, polar bears that would previously stay with the sea ice are increasingly becoming stranded on land. In some circumstances this may lead some local residents to feel that polar bear populations are increasing; however, there is no scientific evidence for this conclusion. In fact, a recent study has demonstrated that increased sightings of polar bears on land in Canada is at lease partially the result of earlier sea ice break-up, not increased numbers of polar bears.

Literature Cited:

Stirling, I. and C. Parkinson. 2006. Possible effects of climate warming on selected populations of polar bears (*Ursus maritimus*) in the Canadian Arctic. *Arctic* 59: 261-275."

With respect to the well documented polar bear population decline in Western Hudson Bay – 22% decline in 17 years – the scientifically sound survey techniques used clearly demonstrate a significant change in actual population, not a shift in habitat use.

4) With a high demand for oil for the foreseeable future and since you want to limit the amount of oil that America can recover from domestic sources of production, do you believe it is in our nation's interests to continue to rely on foreign sources of oil? Wouldn't better policy consist of cultivating domestic sources while developing new technology that will rely less on oil?

As noted by a distinguished group of retired US Admirals and Generals in the 2007 report "National Security and the Threat of Climate Change", which was commissioned by the government-financed Center for Naval Analyses, global warming represents one of the greatest threats to our national security. This threat is compounded by the fact that, as President Bush in his 2006 State of the Union Address clearly stated, our nation is "addicted to oil." Increasing the national security threat from climate change by expanding our nation's addiction to oil is not in our best interest.

Fortunately, as Kassie Siegel observes in her answer to this question, "The good news is that the solutions to global warming – things like increased energy efficiency, fuel economy, and use of renewable energy, as well as changing land use and transportation patterns, will promote our energy independence, as well as improve our quality of life and benefit our economy. On the other hand, we cannot drill our way to energy independence. We can and must protect our nation's air, land, water, and wildlife from further fossil fuel development while simultaneously increasing energy efficiency, decreasing energy demand, and providing new sources of clean, renewable power."

Our nation is blessed with abundant renewable energy and energy efficiency and energy conservation opportunities. Focusing on these clean, positive opportunities is in the best interest of our country's national security, environment, inter-generational equity responsibilities, employment, and economy.

5) On page 6 of your testimony you explicitly state that you don't know the number of polar bears in the Chukchi Sea population or their status. Considering the extensive negative ramifications of regulating our economy's greenhouse gas emissions, would you agree that it is not good public policy to regulate on speculation?

According to numerous leading businesses in our country such as GE, DuPont, Alcoa, and ConocoPhillips, "In our view, the climate change challenge, like other challenges our country has confronted in the past, will create more economic opportunities than risks for the U.S. economy." These companies, and many more, have joined the US Climate Action Partnership to urge Congress to take prompt action to addresses global warming because they are aware of the adverse economic consequences of not systematically regulating and reducing our greenhouse gas emissions. Indeed, as the Stern Report and other economic analyses demonstrate, not addressing global warming will have a much more negative impact on our economy than addressing global warming.

Given this, it is especially imprudent for the Department of Interior to commit the Chukchi Sea to oil and gas development when it admits that it knows little about the basic biological resources of that area, including the number of, the distribution of, and the condition of Chukchi polar bears.

We do know, however, that the number is less than 2,000; that the chance of a significant oil spill in the area is approximately 40%; and that oil is lethal to polar bears.

We also know, from the Fall 2007 USGS reports, that polar bear populations, including that of the Chukchi Sea, are imperiled from environmental changes wrought by a warming climate.

6) Clearly you are trying to use the regulatory procedure of listing the polar bear as an endangered species as a means to limit greenhouse gases. Isn't it in the best interest of our country to develop policy and law through the legislative process where decisions are made by elected representatives rather than appointed or career bureaucrats and innovative interpretations of older laws?

The Endangered Species Act was carefully developed through the legislative process by elected representatives. It clearly reflects a profound and significant commitment by that Congress and an ongoing commitment by subsequent Congresses to protect our nation's precious biodiversity for current and future generations.

We need both to enforce existing laws, including the Endangered Species Act and the Clean Air Act, and to enact new legislation that caps and rapidly reduces greenhouse gas emissions from all sectors of the economy.

7) On page 24, you list actions to protect polar bears on page 24 and state that we need to "reduce greenhouse gas emissions quickly and significantly." How much do you believe emissions need to be reduced by? How should we reach those reductions? Do you agree that developing

countries, specifically India and China, need to be included in any program that reduces greenhouse gas emissions?

As acknowledged by the US Climate Action Partnership mentioned above, US emissions need to be reduced, at a minimum, by 60 to 80% below current levels. The most politically feasible and results oriented manner in which to do this is through a Cap-and-Trade system.

I support America's Climate Security Act (S. 2191), sponsored by Senators Lieberman and Warner. Like others, I certainly hope that this legislation is passed this year. Developing countries such as India and China need to be included in any program to reduce global greenhouse gas emissions, but it is incumbent upon the United States to take the leadership role in this effort.

8) You outline Alaska's renewable energy resources on pages 28 and 29 of your testimony; however, the oil that would be extracted and sold to consumers from the Chukchi lease would not directly contribute to baseload energy. How do you reconcile the different applications of oil for transportation v. renewable energy that would be generated in your scenario? Further, do you recognize that not all states have as extensive renewable energy resources as Alaska and confront various problems to disburse such energy, such as constructing and siting transmission corridors?

First and foremost, our nation needs to embrace immediately cost-effective energy conservation and energy efficiency measures. As the 2008 McKinsey report entitled "Curbing Global Energy Demand Growth: the Energy Productivity Opportunity" demonstrates, there are tremendous, cost-effective energy efficiency and energy conservation strategies that can and should be employed to reduce our baseline energy demands. And, these energy conservation and energy efficiency measures can be adopted nation-wide. This is true in every sector, including buildings, appliances, transportation, energy generation, and manufacturing.

Renewable energy also has the ability to contribute significantly to all of our nation's energy needs. For example, electricity from renewable resources, hydrogen from renewable resources, and biofuels from appropriate renewable resources can power our future vehicle transportation sector. Also, many sources of renewable energy contribute directly to baseload needs, such as geothermal. For others, such as wind, variable power becomes baseload power with the application of increasingly cost effective batteries.

The Union of Concerned Scientists has examined renewable energy potential throughout the nation and concluded that every region has sufficient renewable energy to meet basic Renewable Electricity Portfolio standards. Also, the potential for home-based, distributed renewable energy measures is substantial. For example, simple, cost effective efforts, such as the installation of solar hot water units, can be used in most areas of the nation, and will result in jobs.

9) According to the Congressional Research Service, "There is no evidence to suggest that ice in the Arctic basin disappeared entirely during either of these warm periods, which were of equal or greater warming than predicted by the IPCC's climate-warming models, nor did any ice-dependent species become extinct." What is your reaction to this statement? Considering your long litany of dire consequences due to global warming, shouldn't you take into account historical data for periods that exhibited higher global temperatures than climate change that is currently projected?

While polar bears have experienced climate variability in the past, they have not survived warming analogous to what we will experience in the next century and beyond if greenhouse gas emissions are not sharply reduced. Without rapid reductions in all greenhouse gas pollutants including carbon dioxide, methane, and black carbon, the Arctic will soon be ice-free in the summer. Scientists believe the Arctic has not been seasonally ice-free for approximately one million years (Overpeck et al. 2005), long before polar bears evolved as a species. Polar bears cannot survive the complete loss of their sea-ice habitat, and are already suffering scientifically significant adverse impacts from ice loss that has occurred to date.

Literature Cited:

Overpeck, J.T., M. Sturm, J.A. Francis, D.K. Perovich, M.C. Serreze, R. Benner, E.C. Carmack, F.S. Chapin III, S.C. Gerlach, L.C. Hamilton, L.D. Hinzman, M. Holland,

M.P. Huntington, J.R. Key, A.H. Lloyd, G.M. MacDonald, J. McFadden, D. Noone, T.D. Prowse, P. Schlosser, and C. Vörösmarty. 2005. Arctic system on trajectory to new, seasonally ice-free state. Eos Vol. 86, No. 34:309-316.

10) The *Exxon Valdez* spill was an environmental disaster. Has the oil industry, spurred on by government regulation and public dismay, made significant improvements to prevent more oil spills? With continuing advancements in technology and learning from prior failures, aren't oil spills occurring less frequently, with a quicker emergency response time and less impact on the environment?

The *Exxon Valdez* oil spill was, indeed, an environmental disaster. It also had severe, adverse cultural and economic impacts. Among other lessons, the *Exxon Valdez* oil spill reinforced the fact that human error occurs, and that when human error occurs in a pristine, environmentally sensitive area, the consequences are costly, tragic and long-lasting.

More recently, Alaska has been subjected to serious oil spills on the North Slope from negligent pipeline maintenance and corrosion, and in the Aleutians from human and mechanical errors associated with cargo vessels (e.g. Selendang Ayu). These were very serious post-Exxon Valdez spills that reinforce the fact that significant spills are still occurring in association with oil and gas development and shipping.

In some areas, industry and government have improved oil spill prevention over the last 20 years, but it is important to note that this progress has been uneven across the nation. Industry is to be commended for going beyond current federal mandates in certain prevention technologies. Notably, some companies such as BP/Alaska Tanker Co. and ConocoPhillips, now build new tankers not only with double hulls (as required by OPA 90), but also with twin engines and double rudders. But there are many other mitigations that would reduce risk elsewhere, and government and industry have resisted implementing these, including additional tug escorts and rescue tugs on standby along certain routes and harbors, and real-time tracking of all large ships in US waters. Furthermore, there should be additional Areas To Be

Avoided (ATBAs) to reduce risk of spills from sensitive coastal environments. The arctic needs appropriate protections due to increased shipping there.

Despite the above, oil spill recovery rates have not improved substantially over the same 20-year period. For most spills, less than 10% of the total spill volume will usually be recovered from the environment. This is particularly true in arctic, broken ice conditions, where it will be especially difficult to recover spilled oil in many scenarios/seasons.

We know from the *Exxon Valdez* tragedy that oil spills can have long-lasting, significant impacts on marine ecosystems. Exxon expended approximately $2 billion to attempt to cleanup the spill, and only recovered a very small percentage of what was spilled. And despite a $1 billion Restoration effort by the Exxon Valdez Trustee Council, of which I was a part, today most of the resources and services injured by the *Exxon Valdez* spill still have not fully recovered. Some species such as herring and harlequin ducks are simply not recovering - over 19 years later. For a spill in the colder, more complex Arctic Ocean, there would be little chance of recovering much of the spilled oil, and due to the hyper-sensitivity of the receiving environment, there would almost certainly be long-term, significant damage. Any oil would remain in the arctic environment for decades. In Prince William Sound, oil is still evident in beaches and under rocks 19 years later. This long term damage is precisely the risk we are imposing on the Arctic Ocean ecosystem, including polar bears, by offshore oil and gas development.

Witness Follow-up Questions – Jamie R. Clark
Select Committee on Energy Independence and Global Warming
March 27, 2008

1. *Leaders of Canada's Arctic Inuit people denounced US environmentalists on Monday for pushing Washington to declare the polar bear a threatened species, saying the move was unnecessary and would hurt the local economy. I see Native Americans as conservationists and responsible stewards of the environment. How do you respond to their concerns?*

   Canada's Inuit people are legitimately concerned about the future of their culture and communities. Their culture and subsistence way of life are under increasing pressure from a variety of threats, including harmful influences from non-native society. Many of these harmful influences are exacerbated by climate change, resulting in increased intrusion into their communities of non-native social pressures as the Arctic becomes more accessible from melting sea ice. While Canada's Inuit people do rely on sport hunting of polar bears by primarily American hunters for income, the United States should not abrogate its sovereign responsibilities to protect threatened and endangered species under the Endangered Species Act in order to accommodate the economic concerns of stakeholders in another country. It is the responsibility of the Canadian government to provide sustainable economic opportunities for its citizens. Furthermore, if polar bears are allowed to disappear, no one, including Canada's Inuit people, will benefit economically from their extinction.

2. *Polar bears have survived other warming periods in the last 10,000 years. Do you have any scientific reason to believe that polar bears cannot adapt to some level of climate change? Do we know with certainty what that threshold is?*

   Polar bears have survived much milder and slower warming periods during the last 10,000 years. However, like any species, polar bears cannot adapt above certain thresholds of extreme change, which as a conservation principle we never wish to approach because of the danger of an irreversible extinction. And we have ample evidence that many species in the past could not and did not adapt to earlier rapid changes to their environment.

   What makes this climate warming epoch so threatening to polar bears is that the rate of warming currently experienced is notably greater than the more gradual temperature changes experienced in the earth's geological history. Suddenness of these changes creates far more risk to this species, risk largely due to our own meddling with the environment. At some level, these changes will preclude the polar bear's ability to adapt gradually to alterations in its environment.

   Moreover, past episodes of climate change on Earth occurred without the additional pressures on polar bears caused by extensive human modifications. These modifications include energy development and transportation in the bear's Arctic environment. Other modifications include persistent organic pollutants, which damage the bear's reproductive and immune systems. Pollutants are particularly problematic for polar bears because wind patterns deposit these substances in the Arctic where bioaccumulation magnifies concentrations at each level of the food chain.

In sum, the polar bear today has far less time, fewer places, and more obstacles in making the sort of adjustments to climate change that it otherwise might have been able to make.

3. *Isn't it possible that when conducting a census of polar bears that we could be witnessing a shift in habitat use rather than a significant change in actual population?*

Polar bears show strong and consistent use of sea-ice habitat throughout their range. Only on sea ice do they find adequate numbers and quality of their preferred prey, the various species of ice seals. Polar bears are showing some shifts in habitat as ice disappears, but this is hardly good news.

In fact, it is likely that numbers of polar bears in some subpopulations are now being over-estimated as they move off the sea ice and seek food in coastal habitats and villages where they are easier to observe. This can render a false impression that their numbers are locally stable or increasing when in fact they are being literally pushed off the ice and concentrated in terrestrial locations. Bears are shifting their habitat, losing weight, and showing other signs of population distress because these terrestrial habitats are unsuitable for their life history needs.

4. *With a high demand for oil for the foreseeable future and since you want to limit the amount of oil that America can recover from domestic sources of production, do you believe it is in our nation's interests to continue to rely on foreign sources of oil? Wouldn't better policy consist of cultivating domestic sources while developing new technology that will rely less on oil?*

Defenders of Wildlife does not advocate limiting the nation's energy production. Rather, we support responsible, sustainable energy production that is compatible with the protection and restoration of native plants and animals in their natural habitats and which does not contribute to global warming. Continued reliance on oil and other carbon-based fuels, whether from domestic or foreign sources, will not help us meet the challenge of global warming for polar bears, for ourselves, or for future generations.

5. *You state in your testimony that MMS should refrain from any new oil and gas leasing in the Chukchi Sea and other polar bear habitat until adequate measures are in place to prevent harm from such activity to polar bears and their habitat.*

    a. *What specific measures do you suggest?*

First, implement research programs that document the level of noise, visual distraction, and other disturbances attributed to oil and gas development that interfere with the movement, distribution, foraging, and other life history needs of polar bears and their seal prey. Second, avoid siting any oil and gas development structures in high- or other significant-use areas used by polar bears. Third, alleviate the negative effects by adjusting the timing of the most intrusive energy development activities. Fourth, adjust and modify any energy development as new information about the polar bear's requirements is acquired. Fifth, focus the nation's attention and efforts on alternative energy sources that do not cause more environmental harm.

b. *By stopping new oil and gas exploration, isn't the US becoming even more dependent on oil from unstable or unfriendly nations?*

See my response to question number 4. Dependence on oil is the fundamental problem both from the perspective of risky access to foreign supplies and as a principal cause of global warming. The only real answer to this fundamental problem is developing alternative energy sources that are domestically-controlled, environmentally-friendly, and carbon-neutral.

6. *In a Reuters article on January 15, Inuit leaders claim that listing the polar bear as a threatened species will cause this at-risk people millions of dollars a year in lost revenue from polar bear hunting fees. How should the Inuit people be compensated if this revenue source is eliminated by listing the polar bear as threaten [sic] species, which would make hunting illegal?*

See my response to question number 1. The polar bear is a species threatened with extinction. Absent decisive action to address climate change and to protect this species under the Endangered Species Act, populations of polar bears may vanish forever within the lifetimes of Inuit and other children born this year. Consequently, with or without the Endangered Species Act, the economies of the Inuit peoples cannot be sustained by the continued sale of high-priced trophy licenses to wealthy individuals who wish to shoot imperiled wildlife. With or without the Endangered Species Act, other means will have to be found to sustain the economies of the Inuit peoples. One aspect of this solution in some Inuit villages may be to employ Inuit hunters, at rates comparable to those for trophy hunting, to assist in monitoring and researching polar bears. Tracking and hunting skills could still be used as they are today, but not to kill bears.

7. *You state on page 5 of your testimony that one of the factors that support listing polar bears as threatened is the inadequacy of existing regulatory mechanisms to respond to the threat from global warming. What regulatory mechanisms would you implement?*

Loss of habitat attributed to the effects of climate change in the Arctic is the primary reason for the predicted decline in the size of the total polar bear population by more than 30 percent within the next 35 to 50 years. As polar bear habitat is lost due to climate change, it becomes increasingly important to reduce other human-caused stresses on that habitat, such as those related to oil and gas development. The Agreement on Conservation of Polar Bears requires the U.S to "take appropriate action to protect the ecosystems of which polar bears are a part." However, the principal tool available to the U.S. to implement this duty is the Marine Mammal Protection Act, which primarily governs the take, import, export and sale of polar bears, and does not adequately protect its habitat. The Endangered Species Act provides an urgently needed tool to reduce impacts to polar bear habitat at a time when the retreat of sea ice from the northern coast of Alaska is trapping greater numbers of polar bears on land and intensifying competition with the oil and gas industry for that land. Under the Endangered Species Act, all federal agencies must consult with the Secretary of the Interior, acting through the U.S. Fish and Wildlife Service, to ensure that any action a federal agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or adversely modify or destroy its critical habitat. Thus, listing the polar bear under the Endangered Species Act would provide needed protection for the bear and its habitat that is lacking under current law.

8. *You see global warming as the ultimate problem, is that correct? And does listing a species under the Endangered Species Act do anything to actually curb global warming?*

First, regardless of whether the Endangered Species Act "can actually do anything about climate change," the Secretary of the Interior is required to list the polar bear under the Endangered Species Act because the best scientific and commercial data demonstrate that it is a species that is threatened, i.e., it is likely to become an endangered species within the foreseeable future. Second, the most important actions that we can take immediately to reduce the impacts of climate change on polar bears and other species are ones that decrease stresses to their continued existence from other human causes. While loss of habitat attributed to climate change is the primary reason for the predicted decline in the size of the total polar bear population by more than 30 percent within the next 35 to 50 years, polar bear populations suffer from adverse effects due to the stresses of habitat lost to oil and gas development, over-hunting, and contamination from polychlorinated biphenyls ("PCBs") and other pollutants. The Endangered Species Act is an effective means of reducing these human-caused stresses and ensuring the continued existence of polar bears as we work to reduce greenhouse gases and mitigate the effects of climate change.

9. *On page three of your testimony, you state that you "urge you, the Members of the Select Committee, to make clear that such political interference with conservation will not be tolerated, in the Arctic or elsewhere." I agree, and since all of us on the Select Committee, being politicians and not scientists, doesn't our advise [sic] fit in that category?*

The Endangered Species Act requires that the Secretary of the Interior determine whether to list a species as threatened or endangered "solely on the basis of the best scientific and commercial data available to him." The Secretary is not allowed to make that decision or delay that decision based on concerns about its impact on oil and gas development or on other political and economic considerations. We urge Members of Congress to impress on the Secretary of the Interior and other federal officials that it is their duty to faithfully carry out the law as it is written, and that it is a violation of that duty to allow their political interests to interfere with carrying out that duty.

10. *On page 5 of your testimony, you note that "the need to list polar bears as threatened however, is the unequivocal and extensive loss of polar bear habitat due to global warming." However, the science in this area is not settled – there is great debate even among the IPCC about when an [sic] new*

Arctic summer sea state would be realized. Have you factored in all 15 of the models that the IPCC had available to it?

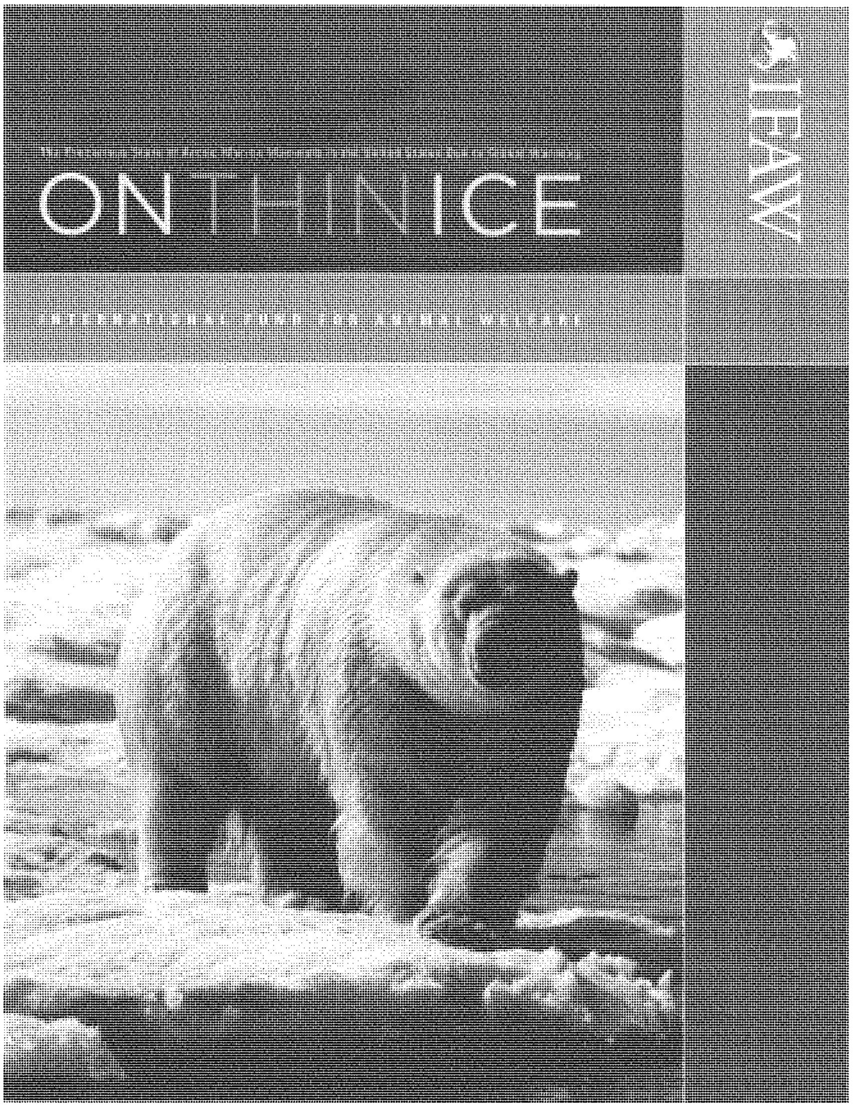
It is true that science operates by continually refining theories and predictions based on new or more extensive data. And the state of scientific understanding of the Arctic ecosystem has improved and models continue to be refined. However there is no credible scientific debate that global warming and climate change have greatly decreased the extent of Arctic Ocean pack ice, the primary and essential habitat of polar bears. Indeed, the original projections of pack ice loss appear to have been overly conservative. The general trends remain unchanged – increased loss of polar bear habitat – although the more recent studies indicate that these changes may in fact be far greater than previously predicted. It now appears that pack ice loss is actually worsening, with estimates now indicating that summer pack ice in the Arctic Ocean will disappear decades earlier than once forecast by the various conservative IPCC models.

11. *Are you aware that there is a study that shows that the magnitude of sea ice and positive or negative trends in the western Arctic and eastern Arctic vary with the phases of the Arctic Oscillation and El Niño-Southern Oscillation? Do you believe that listing polar bears as an endangered species would change oscillation patterns?*

Geologically short-term phenomenon such as the marine oscillations described in the question will not stop or alter the trajectory of climate change. Rather, these are properly viewed as relatively minor variations superimposed on the longer-term trends to the mean parameters of Earth's climate caused by human-induced global warming. Listing polar bears is appropriate because we can reduce other human risks while we act long-term to reduce the causes behind human-induced global warming.

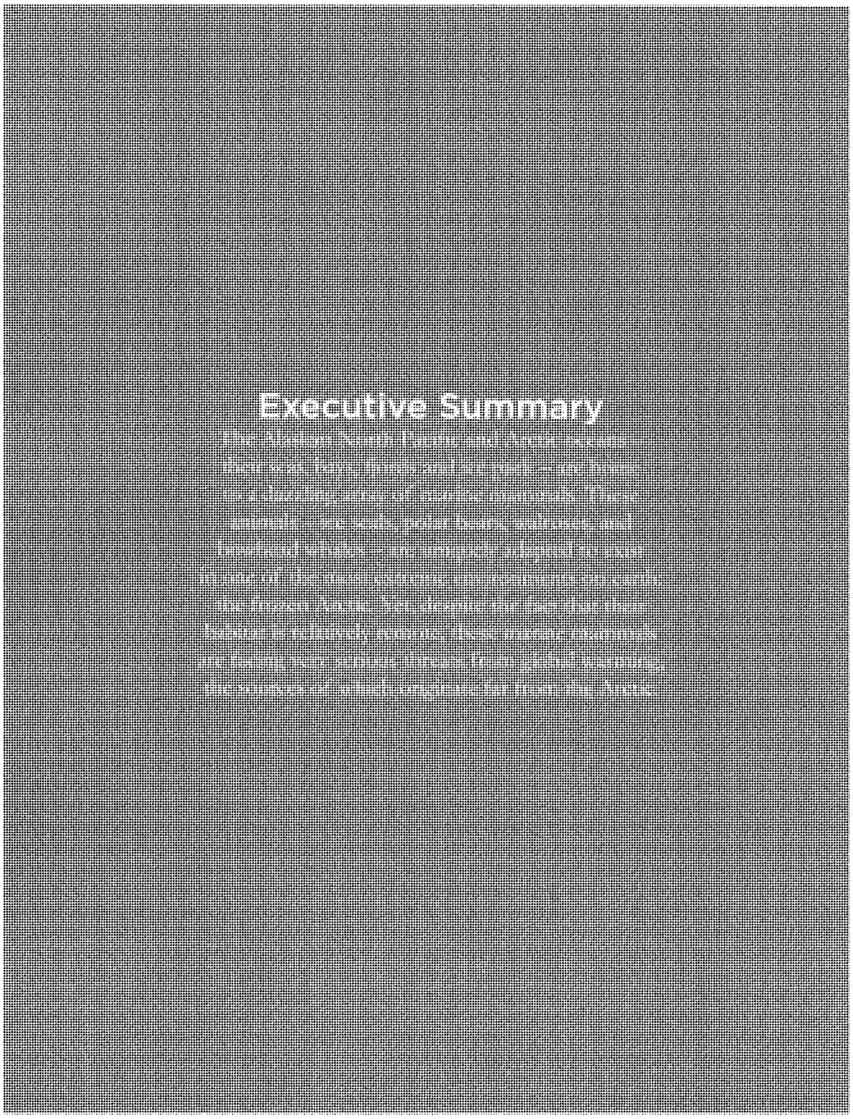
We must act now because natural systems, including the Earth's atmosphere, experience a variety of time lags related to inertia in function. With respect to greenhouse gases, some increased warming will continue because there is a lag between the atmospheric warming *per se*, effects on terrestrial and marine systems, and the effects expressed in wildlife and biological communities. For example, we currently are experiencing some effects from climate change from emissions into the atmosphere that started long ago in the Industrial Revolution.

Another component to the lag times is that other, non-human emissions of greenhouse gasses will continue even as we halt or even reverse our own contributions. For example, much carbon is stored in Arctic permafrost and other locations which, although currently "locked-up", will be ultimately released into the atmosphere as the climate warms. These thresholds, tipping points, and negative feedback loops are a major source of continued warming even if man-made sources are controlled, so taking measures to protect the polar bear now is all the more imperative.



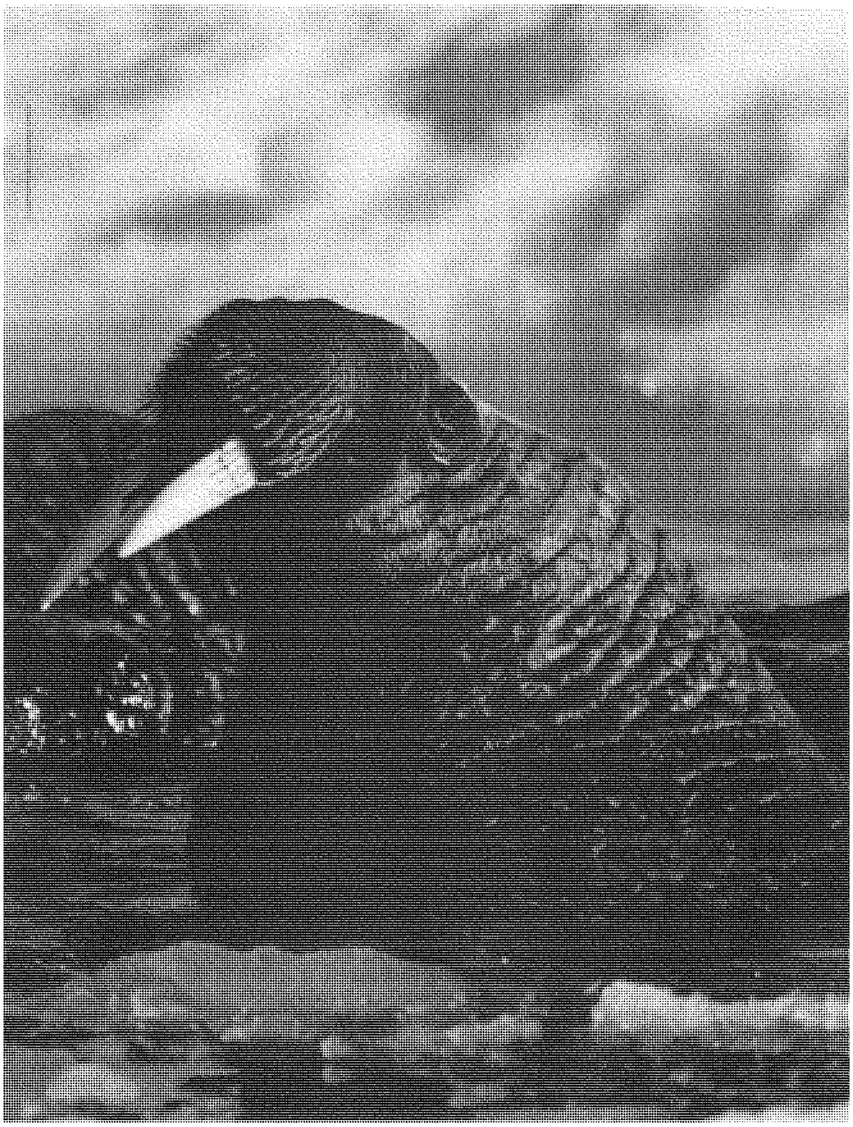
ON THIN ICE

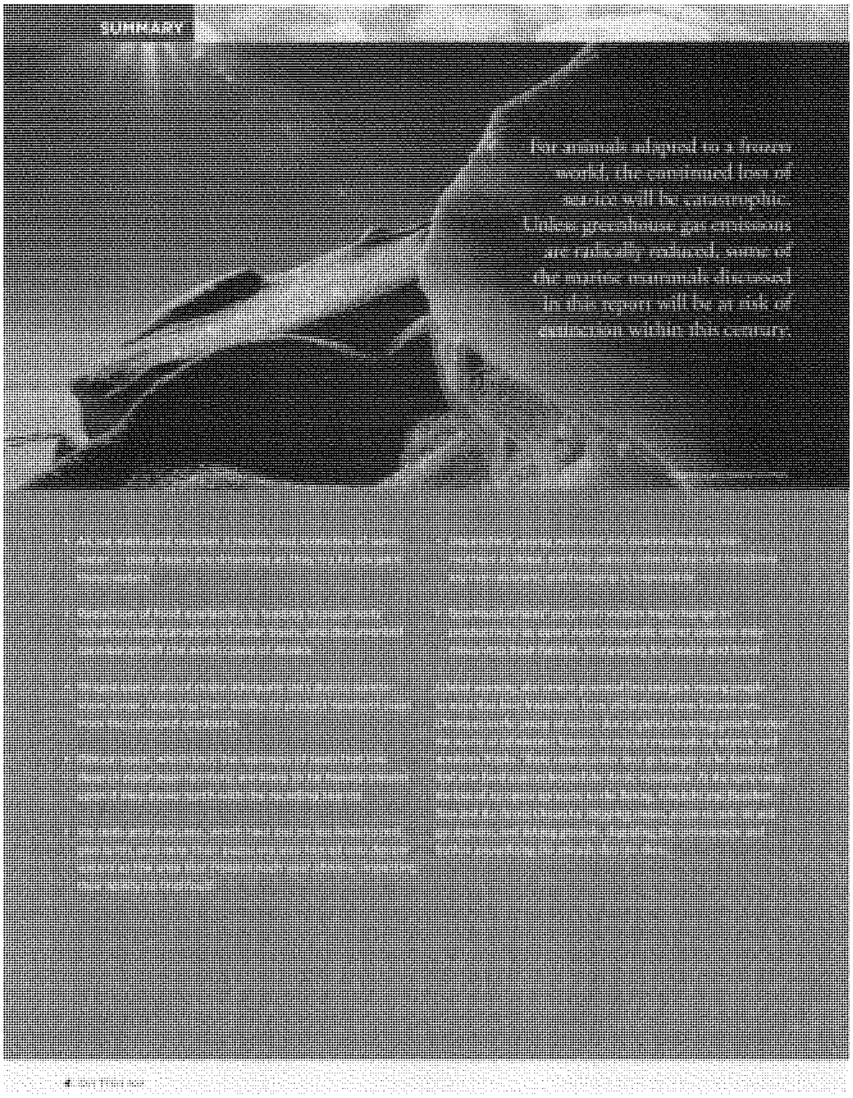
INTERNATIONAL FUND FOR ANIMAL WELFARE



Executive Summary

The Alaskan North Pacific and Arctic oceans – their seas, bays, fjords and ice pack – are home to a dazzling array of marine mammals. These animals – ice seals, polar bears, walruses, and bowhead whales – are uniquely adapted to exist in one of the most extreme environments on earth: the frozen Arctic. Yet, despite the fact that their habitat is relatively remote, these marine mammals are facing very serious threats from global warming, the sources of which originate far from the Arctic.





SUMMARY

For animals adapted to a frozen world, the continued loss of sea-ice will be catastrophic. Unless greenhouse gas emissions are radically reduced, some of the marine mammals discussed in this report will be at risk of extinction within this century.

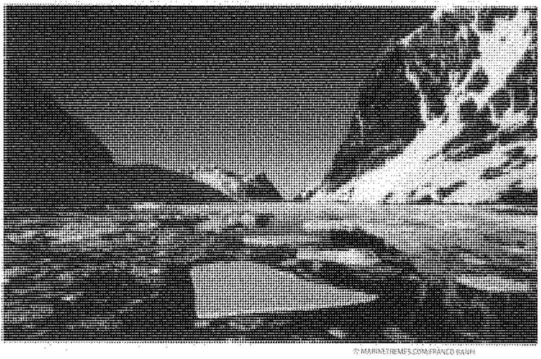
[illegible]

The purpose of this report is to survey what is currently known about the impacts of global warming on ice-dependent marine mammal species in the U.S., including four species of ice seals (bearded, ribbon, ringed and spotted seals), two stocks of polar bears (Southern Beaufort Sea stock, Chukchi/Bering Seas stock), Pacific walruses, and western Arctic bowhead whales (also known as the Bering/Chukchi/Beaufort Seas stock). The report provides an overview of each of these marine mammal species, its habitat, and the relevant federal statutes, agreements and management entities that govern it. Finally, the report explains the serious threat global warming poses to these animals, and the sobering impacts that they are already experiencing as observed by biologists and Alaska Native subsistence hunters.

The report recommends steps that policy makers can take immediately to help improve the prospects for long term survival of these animals in the Arctic. Government at all levels – federal, tribal, state and local – must aggressively employ all legal authorities, international agreements and management bodies to create systemic protections for ice-dependent marine mammals. For example, the federal government must avail itself of tools it has at its disposal under statutes including the Marine Mammal Protection Act and the Endangered Species Act, to begin to take actions that will conserve these animals and their habitat. Appendix 1 of this report provides a brief description of these legal authorities and management entities.

In recognition of the magnitude of the threat of global warming, the International Fund for Animal Welfare (IFAW) urges policy makers to take into account its effects by adopting the strictest precautionary measures in all policies and decisions affecting the welfare and conservation of marine mammals. IFAW favors mandatory programs to reduce the build up of greenhouse gases and encourages individuals to consider how their daily choices impact global warming, and therefore have a direct impact on the welfare of marine mammals. (For the complete text of IFAW's position statement on global warming and marine mammals, please see Appendix 2).

> **There is much that we do not yet understand about the profound changes occurring in the Arctic.**



© MARINETHEMES.COM/FRANCO BANFI

Acknowledgements
This report is based on a 2006 white paper written by Stacey Marz of The Ocean Foundation, whose research was originally funded by the Alaska Oceans Program of the Alaska Conservation Foundation and the George H. and Jane A. Mifflin Memorial Fund. The International Fund for Animal Welfare (IFAW) assisted in the editing of the white paper into a condensed report for public release. Stacey Marz and Monica Medina of IFAW collaborated to create this report from the original white paper. Its publication is jointly funded by The Ocean Foundation, the Wallace Global Fund and IFAW. In addition, Stacey and Monica would like to thank Patrick Ramage, Mark J. Spalding, Tracey Jackson, and Greg Wetstone for their assistance and support in compiling this report. We thank David Lavigne for comments on the draft manuscript, and Julia Hathaway for serving as editor.

Introduction

In Alaska, ice seals, walruses, polar bears and bowhead whales are reliant upon the sea-ice in the Bering, Chukchi and Beaufort Seas. Much of this water is covered by sea-ice for three quarters of the year, from roughly October until June. Sea-ice, which is seasonal, reaches its maximum extent in March and is minimal in September.

There are three major forms of sea-ice in the Arctic:

1. **Shorefast** or **landfast ice** that is attached to the shore and relatively immobile, extending to variable distances offshore;

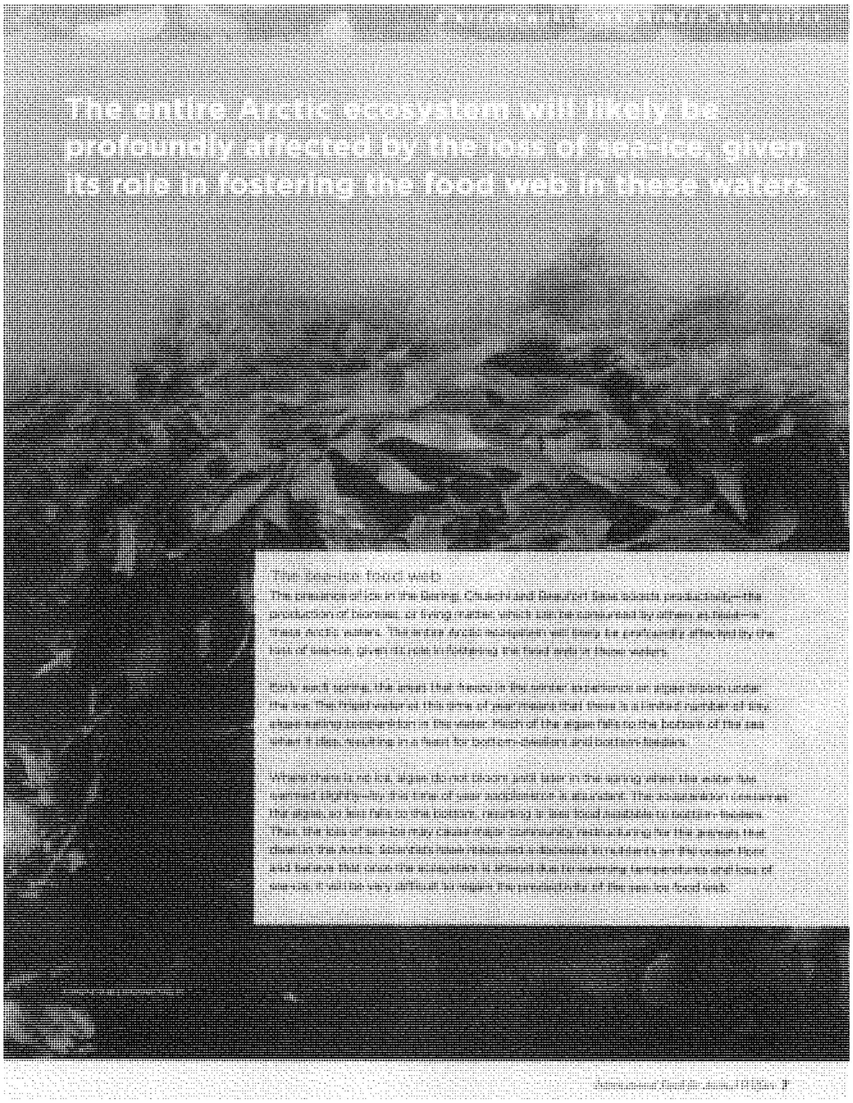
2. **Stamukhi ice** that consists of thick ridges that become grounded during the winter and attach to the ocean bottom; and

3. **Pack ice** that includes first-year and multiyear ice and moves under the influence of winds and currents. Leads, or channels of water that run through a field of ice, form within the pack ice zone.

Many marine mammals rely on this ice environment as a platform for resting and foraging, breeding, traveling, birthing, nursing and mating. Many species also follow the movement of the ice in their migration patterns. However, each species is precisely adapted to different types of ice.

In addition to the serious implications of global warming, compounded by the lack of adequate background information about different species' populations, there are concerns about emerging human uses that will be made possible by more open water in the northern seas and Arctic Ocean. These could include increased oil and gas activities, the development of new commercial fisheries, new and emerging shipping routes, and increased disturbance of, and pollution in, the ecosystem.

Alaska Natives who are experiencing first-hand the impacts of the changing climate have traditional knowledge about the animals' biology, migrations and ecosystems. It is critical that policy makers work with Alaska Natives to understand their concerns about ice-dependent marine mammals, global warming, subsistence, and the human activities that are increasing in the Arctic. Global warming and loss of sea-ice are so significant that all stakeholders need to work cooperatively to develop creative ways to advocate for greenhouse gas reductions and mitigation measures for any potential new Arctic development.



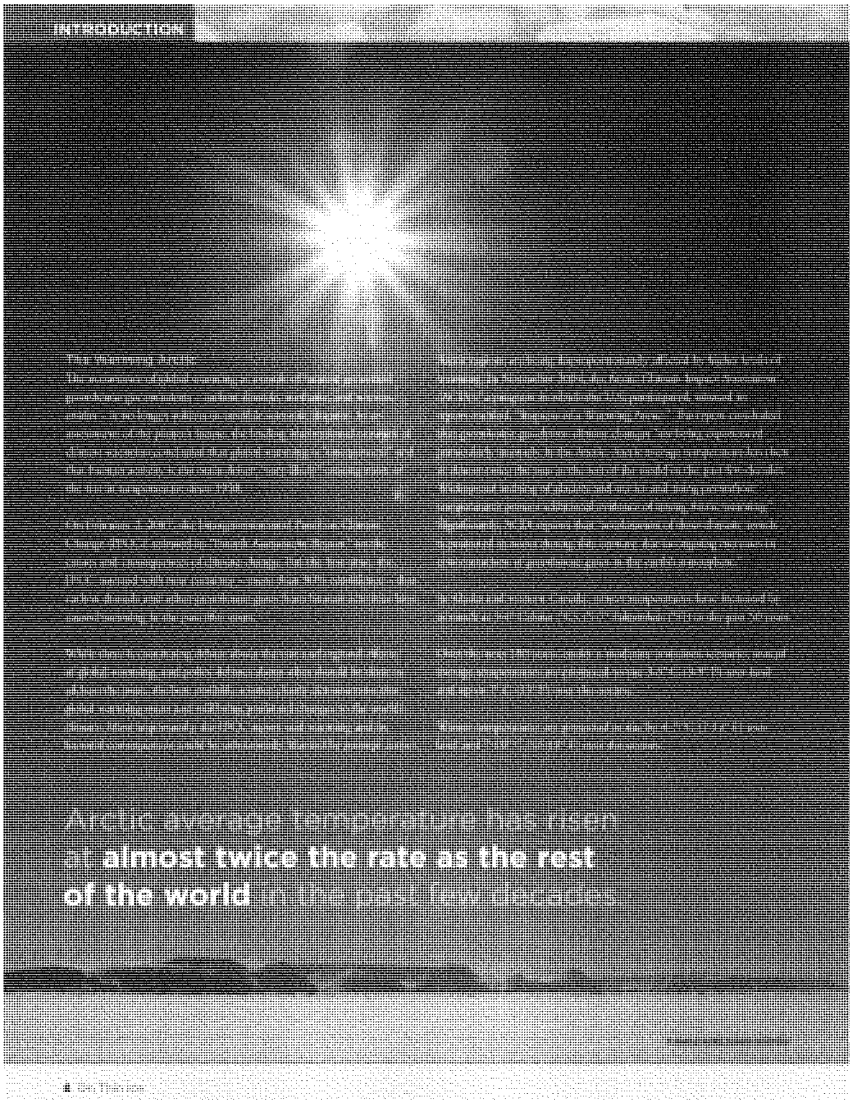
The entire Arctic ecosystem will likely be profoundly affected by the loss of sea-ice, given its role in fostering the food web in these waters.

The sea-ice food web

The presence of ice in the Bering, Chukchi and Beaufort Seas boosts productivity—the production of biomass, or living matter, which can be consumed by others as food—in these Arctic waters. The entire Arctic ecosystem will likely be profoundly affected by the loss of sea-ice, given its role in fostering the food web in these waters.

Early each spring, the areas that freeze in the winter experience an algae bloom under the ice. The frigid water at this time of year means that there is a limited number of tiny algae-eating zooplankton in the water. Much of the algae falls to the bottom of the sea when it dies, resulting in a feast for bottom-dwellers and bottom-feeders.

Where there is no ice, algae do not bloom until later in the spring when the water has warmed slightly—by this time of year zooplankton is abundant. The zooplankton consumes the algae, so less falls to the bottom, resulting in less food available to bottom-feeders. Thus, the loss of sea-ice may cause major community restructuring for the animals that dwell in the Arctic. Scientists have measured a decrease in nutrients on the ocean floor and believe that once the ecosystem is altered due to warming temperatures and loss of sea-ice, it will be very difficult to regain the productivity of the sea-ice food web.



INTRODUCTION

Arctic average temperature has risen at **almost twice the rate as the rest of the world** in the past few decades.

Ongoing warming will continue to severely reduce the extent of sea-ice coverage. Over the past 30 years, the average sea-ice extent has decreased by about 8% each year, or nearly one million square kilometers (386,000 square miles), an area larger than all of Norway, Sweden, and Denmark (or Texas and Arizona) combined, and the melting trend is accelerating. Sea-ice extent in summer has declined more dramatically than the annual average, with a loss of 15-20% of late-summer ice coverage.

September 2007 brought record sea-ice melt in the Arctic. According to the National Snow and Ice Data Center, on September 16, 2007, sea-ice extent dropped to 4.13 million square kilometers – 38 percent below average – prompting speculation about the opening of a Northwest Passage from the Pacific to the Atlantic. Increased ship traffic would constitute further disturbance to ice-dependent marine mammals.

The projected temperature increases and ice loss in the polar regions are also expected to alter ocean currents and salinity patterns. This may force the displacement of some marine species into areas of higher salinity, where truly "oceanic" conditions of salinity prevail. Some scientists have warned that global warming in excess of 1° C could trigger a runaway melting of the world's ice sheets. They also warn that air pollution – particularly soot – may hasten the ice melting by decreasing the reflectance, and increasing the absorbance, of heat radiation by water crystals. Even a few parts per billion of soot in snow can have significant effects.

In the Arctic, higher ocean temperatures and lower salinities, contraction of seasonal sea-ice extent, and rising sea levels are certain to have significant impacts on marine species. Sea-ice is a highly dynamic habitat with different types, forms, stages and distributions that all operate as a complex matrix in determining biological productivity. For marine mammals adapted to sea-ice, a reduction in ice is likely to be reflected initially by shifts in animals' range and abundance. Demographic changes associated with shifts in geographic range will likely be observed as decreased recruitment – fewer new animals added to a population – in areas of reduced sea-ice. The challenge for species to accommodate such change is intensified because of the large area involved, the rapid rate at which the warming is predicted to occur, large inter-annual variations in climate, and the accelerated pace of human development.

Subsistence Hunting

All four species of ice seals are hunted by Alaska Natives in coastal Alaska. Bearded and ringed seals are main subsistence resources and favorite foods of subsistence hunters. Bowhead whales are vitally important to subsistence hunters from the coastal villages in Alaska that are located along the whales' migration route. Alaska Eskimos have hunted bowhead whales for at least 2,000 years. Walruses are an important cultural and subsistence resource along coastal areas of the Bering, Chukchi and Beaufort Seas. In Barrow, walruses comprise the third most important species by weight of harvestable meat.

As global warming continues and the extent and thickness of sea-ice shrinks, the negative impact on subsistence hunting will increase. The many variables that may challenge subsistence hunters include:

- Whether reduced sea-ice will affect the distribution and seasonal movements of marine mammals, and
- Whether the populations will decline due to difficulty in foraging, reduced prey availability, increased predation, and reduced pup and calf survival.

Hunters will likely experience greater difficulty in terms of traveling further distances to find the animals, encountering unstable ice conditions, bigger seas and harsh weather conditions.

> **Reduction in sea-ice leads to shifts in marine mammal ranges and fewer new individuals added to populations.**

---

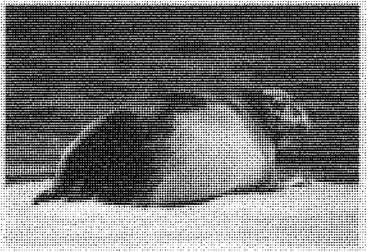
1. In 1988, the World Meteorological Organization and the United Nations Environment Programme established the IPCC. Its mission is to assess available scientific and socio-economic information on climate change, its impacts, options for mitigation, and to provide, on request, scientific and technical advice to the Conference of the Parties to the United Nations Framework Convention on Climate Change. Since 1990, the IPCC has produced a series of reports, papers, methodologies, and other products that have become the standard works of reference on climate change.

2. The Report is the product of some 600 authors from 40 countries. Over 620 expert reviewers and a large number of government reviewers also participated. Representatives from 113 governments, including the United States, reviewed and revised the summary line-by-line before adopting it and accepting the underlying report.

3. The ACIA is a comprehensively researched, fully referenced, and independently reviewed evaluation of Arctic climate change and its impacts for the region and for the world. It has involved an international effort by hundreds of scientists over four years, and also includes the special knowledge of indigenous people.

Ice Seals

Bearded, ribbon, ringed and spotted seals are the four species of North Pacific pinnipeds, aquatic carnivorous mammals with four flippers, collectively known as the ice seals. Ice seals rely on ice as a platform from which to feed, birth their pups and rest. The continued loss of sea-ice will greatly impact the long term viability of these seals. Each seal species will be affected by the loss of sea-ice in different ways, based on its specific habitat preferences and unique biological characteristics.



Bearded Seals

Ribbon Seals

These four ice seal species are important components of the ecosystems in the Bering, Chukchi and Beaufort Seas. They are also an important subsistence resource for many coastal villages in Alaska, Canada and Russia, and are a food source for potentially threatened polar bears. The various species differ in their relationship with sea-ice, which likely influences many aspects of their biology and ecology, including population abundance and distribution, breeding behavior, association patterns, movements and dispersal.

Little is known about these and other aspects of the biology and ecology of ice seals. They have received little attention compared to other pinniped species, some of which are known to be in decline, such as Steller sea lions and northern fur seals. Estimates of population abundance and trends, and recent health assessments of ice seals are not available for most species and are confounded by a poor understanding of even the most fundamental information about them, such as population structure, movements and dispersal.

Ice seals are closely identified with the ice pack, spending the majority of their time on the ice, and migrating northward with the ice during the warmer months. This reliance on sea-ice means that they will be severely impacted as the sea-ice diminishes due to global warming. It is believed that they will become more vulnerable to predation by polar bears, experience reduced body condition, have problems pupping and nursing, and possibly have difficulty foraging when they do not have their usual ice habitat from which to seek food and upon which to rest.

For example, ribbon and spotted seals that currently live at the southern edge of the polar bears' range could expand their range northward into polar bear territory. Ribbon seals are surprisingly tolerant of the presence of humans, and mother ribbon seals leave their pups unattended for long periods of time. This suggests that ribbon seals traditionally occupy regions relatively free from predation. If their habitat shifts north as the ice shrinks, ribbon seals may move into polar bear territory, becoming easier targets than other more wary species.

Ringed seals prefer stable, shore-fast ice for construction of birth lairs. Adequate snow drift accumulation is necessary to build lairs with roofs thick enough to protect pups. Use of suitable birth lairs for thermoregulation is considered critical to the survival of nursing pups when air temperatures fall below freezing. For the past six years, ringed seals have abandoned lairs increasingly early as spring temperature and snow melts have advanced. The transition from lair use to basking on the surface was especially early and abrupt in 2002, as by mid-May all the seals had abandoned their lairs. Many pups in their natal coats were resting on the ice in the open instead of in lairs as would be typical in mid-May. The early snow melts that researchers have observed are consistent with a general pattern observed in the Beaufort Sea. Premature lair abandonment by ringed seals, associated with early snow melts, will likely increase juvenile mortality rates due to exposure to freeze-thaw conditions and predation. In situations when lack of snow cover forced birthing to occur in the open, nearly 100% of the pups died from predation.

In addition, increased rain on snow during the late winter damages or destroys snow lairs, placing pups at risk of hypothermia and predation. Researchers believe that if early-season rain becomes regular and widespread in the future, ringed seal pup mortality will increase.

RINGED SEALS

SPOTTED SEALS

> Ringed seal pups are the smallest among seals and survive only because they are born into snow caves that their mothers build in snowdrifts above breathing holes in the ice. A reduction in ice or early melt could expose these pups prematurely.

© MARINETHEMES.COM/KELVIN AITKEN

especially in the southern extent of their range. Consequently those local populations may be significantly reduced.

Researchers have reported that early spring breakup of ice also negatively impacts the growth, condition and probably the survival of nursing ringed seal pups. Early breakup likely interrupts lactation in mother seals which negatively affects the condition and growth of pups. Earlier ice breakups are predicted to occur more frequently and result in decreased ringed seal productivity and abundance.

Arctic cod is one of the ringed seals' primary prey species. It is heavily reliant on sea-ice throughout its range and uses the underside of the ice to escape from predators. A decrease in seasonal ice cover could have adverse effects on Arctic cod and consequently its availability to ringed seals as food.

[illegible]

- [illegible]
- [illegible]
- [illegible]

SEALS APPENDIX

All four species of ice seals, along with their more southern relative – the harbor seal – are members of the family *Phocidae*, or true seals. Ringed, spotted and ribbon seals are similar in size and general characteristics, although each has a distinct coat pattern.

Bearded Seals *(Erignathus barbatus)*

Bearded seals are the largest true seals found in the seas adjacent to Alaska. As indicated by their name, their most distinguishing feature is their beard of white whiskers, used to find food on the sea floor. Adult bearded seals are gray to brown and do not have spots or other identifying markings. They are usually solitary. Adult males have very audible and musical underwater calls during the breeding period. Bearded seals eat a wide variety of invertebrates and some fish found in and on the rich bottom of the shallow Bering and Chukchi Seas, with their main food sources being crabs, shrimp, clams and snails.

Their primary predators are polar bears, as well as human subsistence hunters who consider bearded seal meat the most desirable of the ice seals. Pups can swim shortly after they are born; this early development of aquatic ability may have evolved as a means of escaping polar bears.

Bearded seals occur throughout the Arctic in the Bering, Chukchi and Beaufort Seas. They usually inhabit shallow waters less than 200 meters deep in areas of broken, moving sea-ice. Spring surveys indicate that bearded seals are typically more abundant within 20 to100 nautical miles (nmi) from shore, on offshore pack ice, than within 20 nmi of shore, with the exception of high concentrations near shore to the south of Kivalina.

Ribbon Seals *(Histriophoca fasciata)*

Ribbon seals are medium-sized in comparison to other ice seals in Alaskan waters. By the age of four, the ribbon seal has four distinct, light-colored ribbons on a dark background—with ribbons encircling the neck or head, the posterior trunk near the level of the navel, and one on each side of the body broadly encircling the front flippers.

Although they eat a variety of different foods, their main prey is fish. In regions where pollock are present, they usually comprise the major single prey item. Areas of ribbon seal abundance usually occur in regions where pollock are also abundant. Ribbon seals probably dive to depths of up to 200 meters in search of food.

Ribbon seals range northward from Bristol Bay in the Bering Sea into the Chukchi and western Beaufort Seas. In Alaskan waters, ribbon seals are found in the open sea, on the pack ice, and only rarely on shorefast ice. They are most abundant in the northern part of the ice front in the central and western parts of the Bering Sea.

Ringed Seals *(Phoca hispida)*

Ringed seals are the most common and widespread seal species in the Arctic. Ringed seals are the only ones that can survive in completely ice-covered waters: other ice seals need natural surface openings to breathe. With strong, specially adapted claws on their front flippers, ringed seals dig out breathing holes in the ice and scratch through up to two meters or more by the end of the winter.

Ringed seals are among the smallest of all the pinnipeds, with adult ringed seals in Alaska rarely exceeding 1.5 meters in length and 68 kg in weight. Their basic coloration pattern is a gray back with black spots ringed with light marks and a light belly; the seal gets its name from the ringed black spots. Weighing about 4 kg at birth, ringed seal pups survive only because they are born into subnivean lairs (snow caves) that their mothers excavate in snowdrifts above breathing holes in the ice. Throughout the winter and spring, the only access to the lair is through the breathing hole below. The pups are nursed in the lairs where they are safely concealed for most or all of the first two months of life.

During winter, ringed seals are most abundant close to shore on the shorefast ice. As a result, they have been important to the coastal Alaska Native villages as a source of food and usable products. In addition to humans, the chief predators of ringed seals are polar bears. However, Arctic and red foxes, walruses, dogs, wolves, wolverines, and ravens also are known to prey on ringed seals. Ringed seals eat a variety of invertebrates and fish, with the most important being Arctic cod, saffron cod, shrimp, and other crustaceans.

Ringed seals have a circumpolar distribution from 35 degrees N to the North Pole, occurring in all seas of the Arctic Ocean. The Alaska ringed seals, associated with pack ice for much or all of the year, have a range extending from the Beaufort Sea to the Bering and Chukchi Seas. They have been found as far south as the Aleutian Islands. They occupy seasonal and permanent ice, preferring large ice floes greater than 48 meters in diameter and are often found in the interior ice pack where the sea-ice coverage is greater than 90%. Many seals are reported to migrate north-south or inshore-offshore on a seasonal basis in response to ice availability, and there is evidence of long-distance migration and dispersion, particularly for juvenile seals.

Spotted Seals *(Phoca largha)*

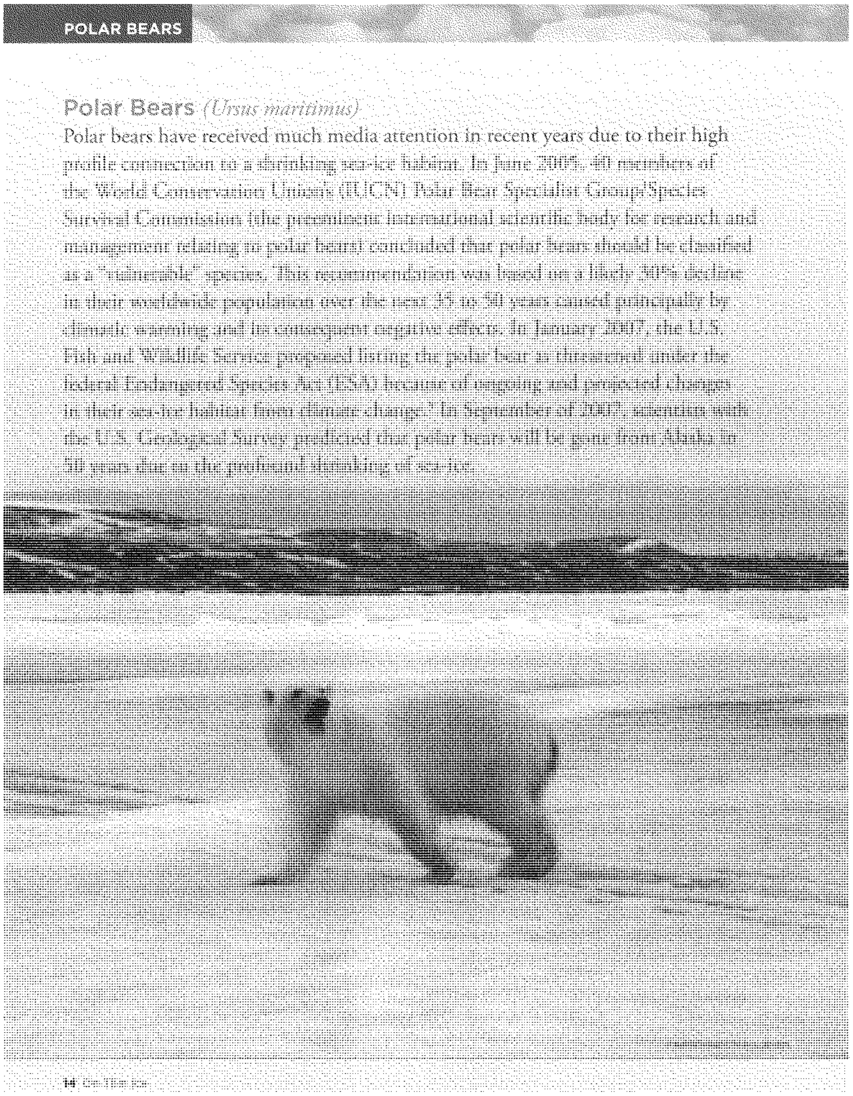
Spotted seals are of medium size, similar in size to harbor and ribbon seals, larger than ringed seals, and considerably smaller than bearded seals. The snouts of spotted seals are somewhat elongated, resembling those of most dogs. Spotted seals are named for the numerous dark, irregularly shaped spots that are sometimes encircled by a faint ring on a lighter background, usually of a brownish-yellow color.

During the spring breeding season, spotted seals are found at the southern edges of the pack ice, dependent on openings between ice floes for access to air and the ice surface. Groups of three seals are often seen together on the ice in the early spring, consisting of a female, her mate and her new pup from her mate of last season. It is thought that the male joins the female about 10 days before she gives birth on the ice, and after her pup is born, he mates with her, probably in the water. Pups are not capable swimmers during their first few weeks of life and have a 45% mortality rate for the first year. In late spring-summer, spotted seals gather to molt among the ice remnants, and sometimes on land when ice is unavailable.

© CAPTAIN BUDD CHRISTMAN, NOAA CORPS

Their principal food source appears to be schooling fish, although the total range of food varies depending on geographical and seasonal differences. Data from satellite tags suggests that spotted seals dive to the bottom to feed. Known predators include polar bears, sharks, killer whales, walruses, Steller sea lions, brown bears, wolves, and foxes.

Spotted seals are distributed along the continental shelf of the Beaufort, Chukchi, Bering, and Okhotsk Seas south to the northern Yellow Sea and western Sea of Japan. They spend the winter and spring offshore along the ice front throughout the Bering Sea. In the summer, they are found along the coast "hauling out" on beaches, barrier islands and remote sandbars on river deltas. Spotted seals form large aggregations on the ice and at favored locations on land. The largest land aggregations in Alaska are at Kasegaluk Lagoon in the Chukchi Sea, near Cape Espenburg in Kotzebue Sound, and on bars and shoals in Kuskokwim Bay. Several thousand seals may be hauled out together in these areas.



Polar Bears *(Ursus maritimus)*

Polar bears have received much media attention in recent years due to their high profile connection to a shrinking sea-ice habitat. In June 2005, 40 members of the World Conservation Union's (IUCN) Polar Bear Specialist Group/Species Survival Commission (the preeminent international scientific body for research and management relating to polar bears) concluded that polar bears should be classified as a "vulnerable" species. This recommendation was based on a likely 30% decline in their worldwide population over the next 35 to 50 years caused principally by climatic warming and its consequent negative effects. In January 2007, the U.S. Fish and Wildlife Service proposed listing the polar bear as threatened under the federal Endangered Species Act (ESA) because of ongoing and projected changes in their sea-ice habitat from climate change.[7] In September of 2007, scientists with the U.S. Geological Survey predicted that polar bears will be gone from Alaska in 50 years due to the profound shrinking of sea-ice.

Changes in sea-ice cover and in the timing of ice freeze-up and break-up have significant effects on polar bears. The Polar Bear Specialist Group of IUCN reports:

- Changes that alter the period of ice coverage could affect polar bear distribution and condition:
    - With ice pack shrinkage, polar bears may spend greater amounts of time on land
    - Polar bears using deteriorating pack ice may experience increased exertion associated with movements and swimming, using up valuable stores of fat
    - More extensive use of terrestrial areas will also result in diminished physical condition due to use of fat stores for energy
    - Such reduced physical condition could negatively affect cub production and survival
- The impact of climate change on prey species will have a negative effect on polar bears:
    - Decreased snow or increased seasonal rain could affect ringed seal pupping as there might not be adequate snow for construction of birth lairs; additionally, increased rainfall could collapse birth lairs and reduce seal productivity
    - Prey reductions could affect polar bear condition and ultimately cub production and survival
- Denning could be impacted by unusual warm spells:
    - Access to high quality denning areas could be limited or restricted
    - Use of less suitable denning habitat could impact reproduction and cub survival
    - Rain or warming could directly cause snow dens to collapse or be subjected to ambient conditions
    - Loss of thermal insulation properties in opened dens could affect cub survival

In Alaska, there is evidence of decreased polar bear body condition, and deaths from drowning, starvation and cannibalism. In recent years, there have been record low ice packs in Alaska's Beaufort Sea region, pushing more and more polar bears onto land for protracted periods. Hungry bears are drawn to village dumps, whale carcass sites from Native subsistence hunts, and other settled areas where they come into conflict with people.

Pack ice is the primary summer habitat for Alaskan polar bears. Shore-fast ice is used for feeding on seal pups, movement, and occasionally for maternity denning. These areas attract seals and other marine mammals, providing polar bears with preferred winter and spring hunting habitat. Snow cover is also part of polar bear habitat because it provides insulation and cover for young polar bears in dens, and because it is where they can find ringed seals in birth lairs.

Polar bears expend more energy in conditions of reduced ice thickness and extent. Arctic sea-ice circulation is clockwise and polar bears tend to walk against this movement to maintain a position near preferred habitat within large geographical home ranges. With diminished ice thickness, there is increased transport of multi-year ice from the polar region, requiring polar bears to work harder to maintain their position near preferred habitat. As sea-ice moves more quickly or becomes more fragmented, polar bears use more energy to maintain contact with consolidated ice.

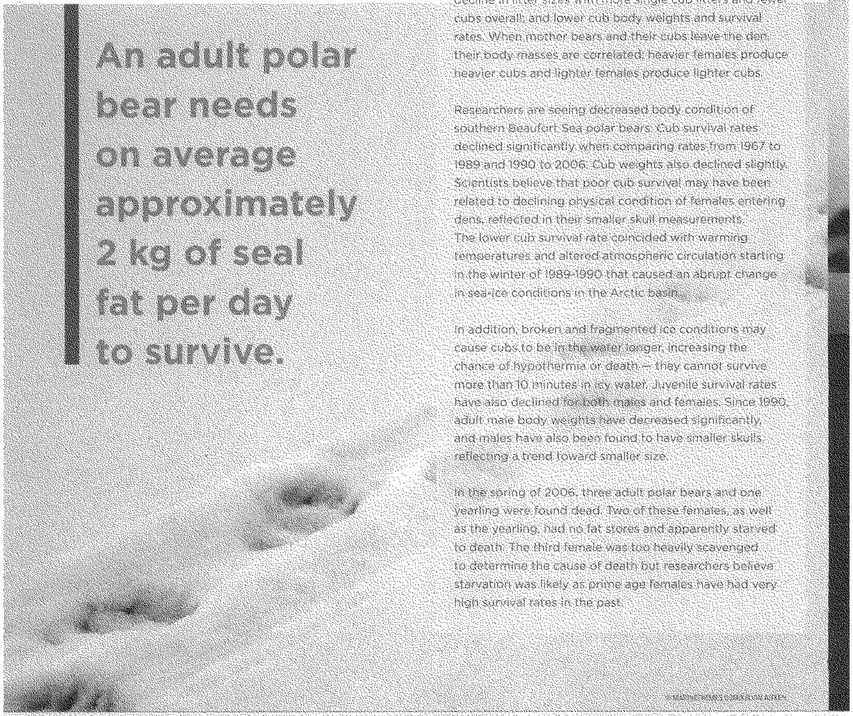
During summer periods the remaining ice in much of the central Arctic is now positioned away from the more productive continental shelf waters and over much deeper, less productive waters in the Beaufort and Chukchi Seas. As the open water enlarges, polar bears spend more time and energy swimming. In 2004, scientists documented for the first time four polar bear drownings in open water off Alaska and extrapolated that 27 bears may have drowned during that event after trying to swim between shore and distant ice.

> **Polar bears catch very few seals in open water — sea-ice is essential as a platform from which they hunt.**

---

5. A notice of review for the proposal was issued and public comments were accepted by the Interior Department through April 9, 2007.

Researchers suggest that as habitat patch sizes decrease, available food resources will also decline, resulting in reduced polar bear residency time and increased movement in search of food. Ringed seals, the polar bear's primary prey, are projected to decline due to reduced sea-ice habitat and decreased snowfall that prevents adequate birth lairs necessary to protect ringed seal pups from freezing air. Polar bears cannot offset energy losses from decreased seal consumption by using terrestrial habitat, because food such as berries, snow geese and caribou do not represent significant energy sources. Nutritional stress would result. The consequences of increased energetic costs to polar bears are reduced weight and condition and a corresponding reduction in survival and recruitment rates.



An adult polar bear needs on average approximately 2 kg of seal fat per day to survive.

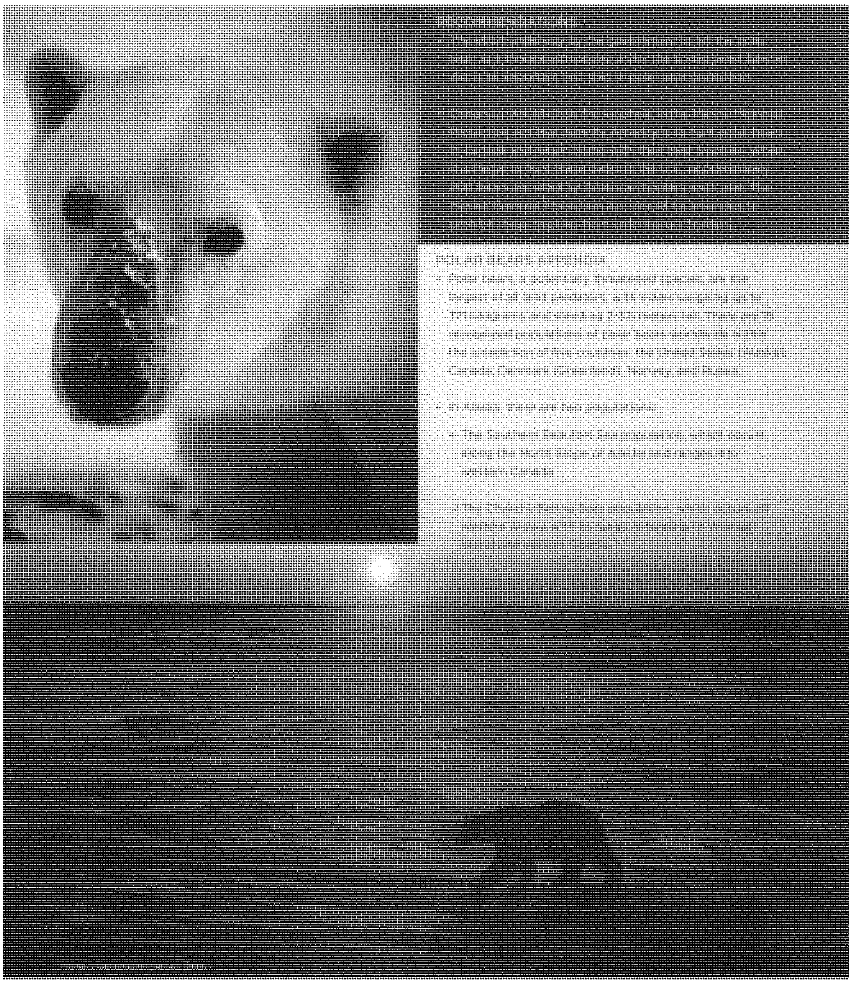
LOSING WEIGHT

Declines in fat reserves during critical times in the polar bear life cycle are likely to lead to numerous problems. These include: delay in the age of first reproduction; inadequate fat reserves to complete successful denning; decline in litter sizes with more single cub litters and fewer cubs overall; and lower cub body weights and survival rates. When mother bears and their cubs leave the den, their body masses are correlated; heavier females produce heavier cubs and lighter females produce lighter cubs.

Researchers are seeing decreased body condition of southern Beaufort Sea polar bears. Cub survival rates declined significantly when comparing rates from 1967 to 1989 and 1990 to 2006. Cub weights also declined slightly. Scientists believe that poor cub survival may have been related to declining physical condition of females entering dens, reflected in their smaller skull measurements. The lower cub survival rate coincided with warming temperatures and altered atmospheric circulation starting in the winter of 1989-1990 that caused an abrupt change in sea-ice conditions in the Arctic basin.

In addition, broken and fragmented ice conditions may cause cubs to be in the water longer, increasing the chance of hypothermia or death — they cannot survive more than 10 minutes in icy water. Juvenile survival rates have also declined for both males and females. Since 1990, adult male body weights have decreased significantly, and males have also been found to have smaller skulls, reflecting a trend toward smaller size.

In the spring of 2006, three adult polar bears and one yearling were found dead. Two of these females, as well as the yearling, had no fat stores and apparently starved to death. The third female was too heavily scavenged to determine the cause of death but researchers believe starvation was likely as prime age females have had very high survival rates in the past.



[illegible]

POLAR BEARS APPENDIX

- Polar bears, a potentially threatened species, are the largest of all land predators, with males weighing up to 771 kilograms and standing 3.4 meters tall. There are 19 recognized populations of polar bears worldwide, within the jurisdiction of five countries: the United States (Alaska), Canada, Denmark (Greenland), Norway, and Russia.
- In Alaska, there are two populations:
  - The Southern Beaufort Sea population, which occurs along the North Slope of Alaska and ranges into western Canada.
  - [illegible]

POLAR BEARS

Only the Southern Beaufort Sea population can be reliably estimated. The IUCN's Polar Bear Specialist Group estimates the population at 1,800 bears. The Chukchi Bering Sea population is estimated at 2,000, but that number is unreliable due to widespread poaching in Russia.

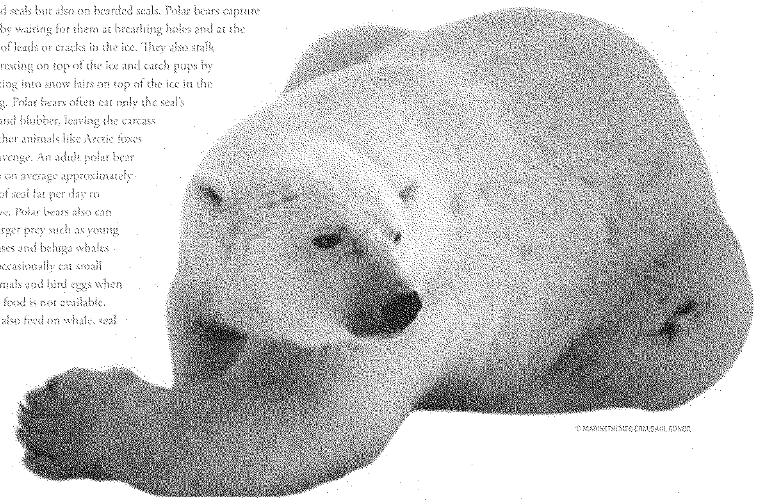
Polar bears are superbly adapted for Arctic survival, with physical characteristics that make them especially suited to live in the extremely cold ice environment. Polar bear coats are water-repellant and provide a thermoregulatory benefit, helping to capture sunlight as an external source of heat. Their bodies are entirely fur-covered except for their noses, and they have a thick layer of insulating fat (more than 11 cm thick in places) that keeps their body temperature and metabolic rate stable at -36.66 degrees Celsius. Their claws are suited to grasping prey and for walking on ice, with "suction cups" on the underside of their feet providing increased ice traction. Individuals may travel very long distances to find mates or food. They are agile in the water and can swim as fast as 10 km per hour. They have been seen 160 km from the nearest land or ice.

Polar bears' oar-like feet make them expert swimmers and also serve to spread their weight on the ice. Their acute sense of smell enables them to find seals in snow caves.

At the top of the Arctic food web, polar bears prey primarily on ringed seals but also on bearded seals. Polar bears capture seals by waiting for them at breathing holes and at the edge of leads or cracks in the ice. They also stalk seals resting on top of the ice and catch pups by breaking into snow lairs on top of the ice in the spring. Polar bears often eat only the seal's skin and blubber, leaving the carcass for other animals like Arctic foxes to scavenge. An adult polar bear needs on average approximately 2 kg of seal fat per day to survive. Polar bears also can kill larger prey such as young walruses and beluga whales and occasionally eat small mammals and bird eggs when other food is not available. They also feed on whale, seal and walrus carcasses and have been increasingly congregating around bowhead whale remains from subsistence harvests.

Polar bears may be among the most adept of all mammals in their ability to survive food and water deprivation. While polar bears do not undergo true hibernation, both male and female polar bears can enter a state termed "walking hibernation" at any time of year when food supplies are scarce. The bears' metabolism alters to a hibernation-like state, facilitating significant energy conservation. Polar bears are largely food-deprived while on land in the ice-free period of the year, surviving on stored fat reserves.

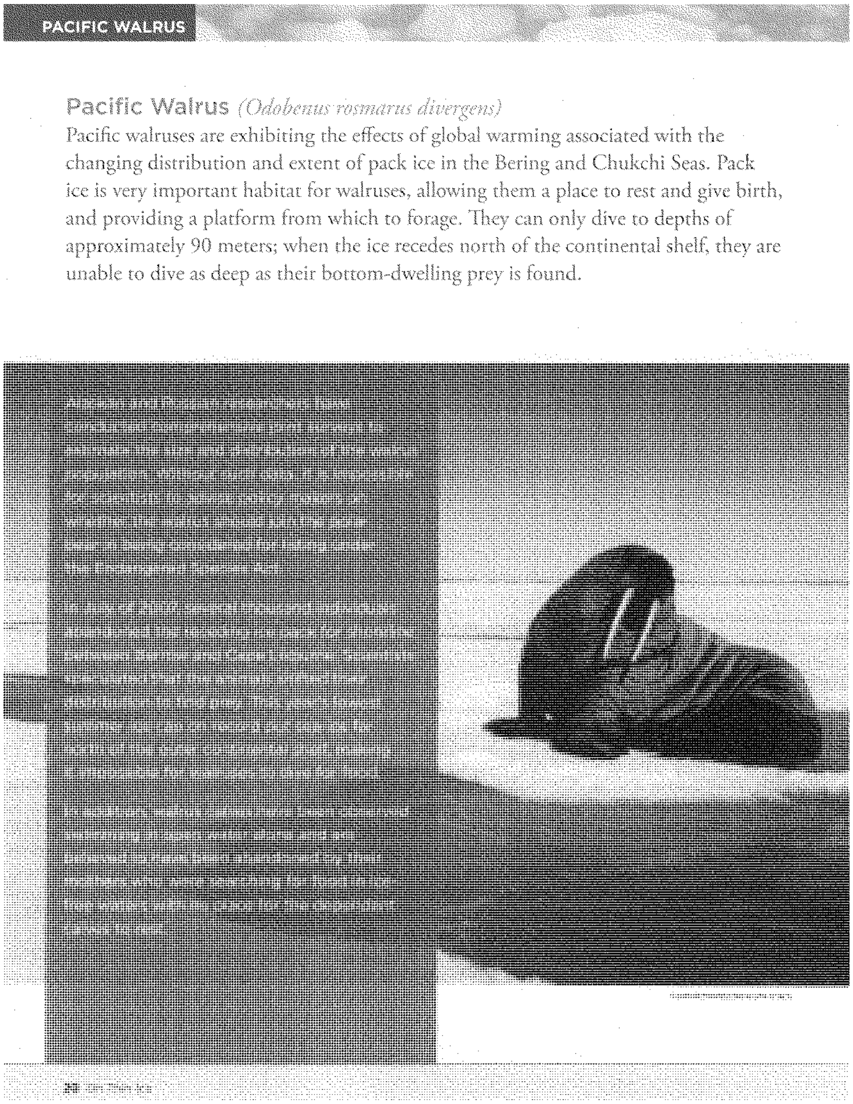
Polar bears have a relatively low reproductive rate, with females reaching breeding age when they are from four to six years old, producing small litters and few young in their lifetime. If the cub survives through the weaning stage, the female can breed no more than every three years. Polar bears mate on the sea-ice in the spring, but have delayed implantation so fetal development is arrested until the fall. After mating, a female must accumulate sufficient fat reserves to survive and also support her cubs from the time she enters the maternity den, between late October and mid-November, until the time the family emerges in the spring and begins to feed.



© MARINETHEMES.COM/SAUL GONOR

Their acute sense of smell enables them to find seals in snow caves.

Polar bears are most abundant near coastlines and the southern edge of the ice, but they can occur throughout the polar basin. They have an extensive range, related to the seasonal position of the ice edge and distribution of seals. Beaufort Sea polar bears appear to spend about 25% of their time along the Chukchi Sea coast of northwestern Alaska. The Chukchi Sea population winters in the northern Bering Sea and southern Chukchi Sea adjacent to Russia and western Arctic Alaska, and its members seldom enter the Beaufort Sea. During the summer, polar bears are found near the edge of the pack ice in the Chukchi Sea and Arctic Ocean, mostly between 70° and 72° North latitude. In October and November, males head out onto the pack ice where they spend the winter. Female denning occurs along the North Alaska coast, especially within the Arctic National Wildlife Refuge and on the adjacent sea-ice. Pregnant females dig dens in the snow on land or near shore sea-ice where they spend the winter, give birth, and nurse their young.

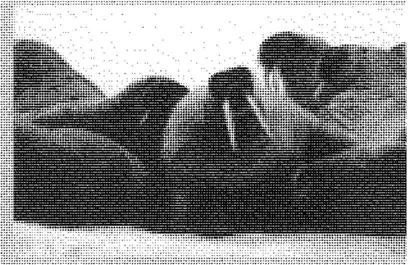


PACIFIC WALRUS

Pacific Walrus *(Odobenus rosmarus divergens)*

Pacific walruses are exhibiting the effects of global warming associated with the changing distribution and extent of pack ice in the Bering and Chukchi Seas. Pack ice is very important habitat for walruses, allowing them a place to rest and give birth, and providing a platform from which to forage. They can only dive to depths of approximately 90 meters; when the ice recedes north of the continental shelf, they are unable to dive as deep as their bottom-dwelling prey is found.

© MARINETHEMES.COM/PAUL JACKSON



[illegible]

As noted, walruses are distributed only over continental shelves because they cannot effectively feed at depths much beyond 90-100 meters. After breeding on the winter ice in the Bering Sea, the males retreat to coastal areas while the females and young of up to age three retreat with the ice into the Chukchi Sea. There they feed intensively in between periods of resting and nursing on the ice.

In 1998, the sea-ice in the Chukchi and Beaufort Seas retreated unusually far to the north and by September it covered 25% less of the Arctic Ocean than during the minimum for the previous 35 years. Vessel-based researchers surveying walruses found that substantial portions of the ice edge had receded north of the continental shelf where the water was too deep for walruses to feed. Continued warming and reduction in ice over the continental shelf in summer and fall would likely reduce the amount of forage available to lactating walruses, jeopardizing survival of nursing calves.

Calves have been reportedly abandoned on the ice as well. In April 2006, *Aquatic Mammals* reported that walrus calves had apparently been stranded far offshore by melting sea-ice in the Arctic Ocean.

The sightings of lone calves coincided with evidence of rapidly melting seasonal ice in the shallow continental shelf region where walruses feed on clams and crabs. Researchers measured an unusually warm mass of water moving onto parts of the continental shelf north of Alaska from the Bering Sea that caused seasonal sea-ice to rapidly melt. Sea temperatures there were more than six degrees warmer than those observed at the same time and location two years earlier. In areas where sea-ice remained, the sea floor was too deep, about 2,800 meters, for adult walruses to feed. Calves, which are dependent on mothers' milk for up to two years, cannot forage for themselves. Researchers believe that the mothers had to swim farther and farther from shore to find ice for the calves to rest on and eventually had to abandon them in waters too deep to reach food. The scientists noted that, "when sea-ice retreats to such deep water, as it did in 2004, there are no platforms in shallow waters for mothers to rest and to leave their calves while they feed, and the pairs become separated."

If these observations portray a larger trend, a warmer Arctic may lead to a decrease in the walrus population. "If walruses and other ice-associated marine mammals cannot adapt to caring for their young in shallow waters without sea-ice available as a resting platform between dives to the sea floor, a significant population decline of this species could occur," the research team wrote in *Aquatic Mammals*.

[redacted]

WALRUS APPENDIX

Walruses are the largest pinnipeds in the Arctic and sub-Arctic seas, with a geographic range that completely encircles the polar basin. The Pacific walrus, which accounts for 80% of the world's walrus population, is one of two geographically isolated subspecies of walrus. It is found in the North Pacific Ocean's Bering Sea and in Arctic waters from the East Siberian Sea to the western Beaufort Sea, as well as in the Laptev Sea. The other recognized subspecies is the Atlantic walrus.

Walruses require ice thickness of at least 60 centimeters to support their weight and allow ready access to the water for foraging. They prefer first-year ice with natural openings such as leads, and are seldom found in areas of extensive unbroken ice. Ice that rises too high out of the water, such as multi-year floes, prevents walruses from coming out of the water. Thus, in winter their concentrations are in areas of divergent ice flow or along the margins of persistent open water areas, also known as polynyas. In summer those associating with ice are found along the southern margin of the Chukchi pack ice, moving farther into the pack in stormy seas. Floe size and topography appear to be important in the selection of haulout sites. From the ice, walruses feed in benthic areas – at the bottom of the ocean – which are composed of soft, fine sand.

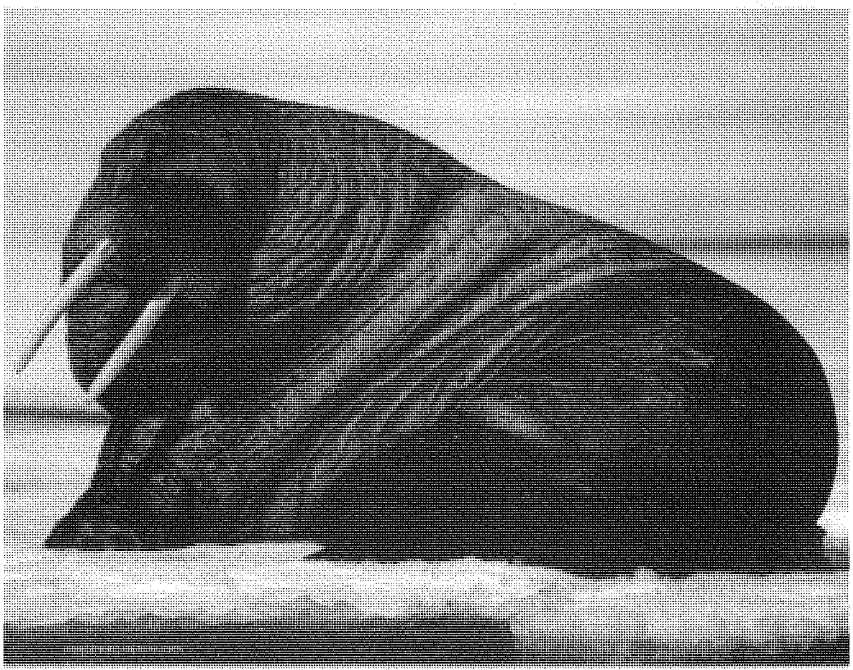
Walruses have flexible hind flippers that can be rotated forward, allowing them to move on land by walking on all four appendages. The genus name *Odobenus* means tooth-walker, referring to their downward projecting tusks, which are elongated upper canine teeth and exist in both sexes. Walruses use their tusks for fighting, climbing onto both land and ice, and as a tool to break up an ice floe to keep breathing holes open or to retrieve calves that are stuck in the ice. Tusks are used a great deal in mutual display; the strongest males with the largest tusks are dominant.

Walruses also have quill-like whiskers on their snouts, giving them a mustache-like appearance. They have small eyes and no external ears. The hide, which is very thick and tough, is dark when young but lightens with age. The head and body are covered with short, tawny hair giving walruses a chestnut to cinnamon coloration. The flippers are bare. When immersed in cold water walruses appear white because of a restriction of blood to the skin, but when hauled out, their skin becomes filled with circulating blood and turns pink to red. Walruses have air sacs under their throats which when full act like floatation bubbles and allow walruses to bob vertically in the water and sleep. Walruses are gregarious, with groups of up to several hundred hauling out on ice floes or along preferred coastal areas.

Commonly found in relatively shallow water areas close to ice or land, walruses spend about half their time in the water and half their time on beaches or ice floes where they gather in large herds. They forage from ice above the continental shelf for bottom-dwelling invertebrates. Their mouths are uniquely adapted for eating buried clams and invertebrates. Walruses squirt high-power jets of water out of their mouths like a water drill to unearth clams mired in the mud at the bottom. Scientists believe that they then use strong suction to remove the fleshy parts of the prey from the shell and then discard the shell. This intensive tilling of the sea bottom releases nutrients into the water column, provides food for scavengers such as starfish, and increases the patchiness of the bottom, which likely plays an important community structuring function for benthic and pelagic animals.

Pacific walruses range throughout the shallow continental shelf waters of the Bering and Chukchi Seas and occasionally in the eastern Siberian Sea and western Beaufort Sea where their distribution is closely linked with the seasonal distribution of the pack ice. During winter, walruses congregate within the Bering Sea, often downwind of major islands and off river estuaries where motion in the sea-ice forms leads and openings. As spring melting shifts the ice northward, females and their young follow leads into the Chukchi Sea. Most adult males remain south in open water for the summer, hauling out on several islands and spits in Bristol Bay and the Gulf of Anadyr. In fall, this pattern reverses and females move south and males go north to meet up for the January-February breeding season in the Bering Sea pack ice.

Walruses also use terrestrial haulouts on isolated islands, points, spits, and headlands with protection from strong winds and surf. Walruses are not usually found on shores with permanent human occupation. Haulout locations are possibly linked to social factors, learned behavior, and proximity to prey, but little is known about such factors. Major terrestrial haulouts are found in Bristol Bay at Cape Seniavin, Round Island, Cape Pierce, and Cape Newenham. Some individual walruses consistently occupy specific seasonal haulouts, suggesting at least some degree of site fidelity.



Bowhead Whales *(Balaena mysticetus)*

Global warming and the associated changes in the distribution and extent of pack ice in the Bering, Beaufort and Chukchi Seas is a significant concern relative to the wellbeing of bowhead whales. Bowhead whales are sensitive to changes in Arctic weather, sea-surface temperatures, ice extent and the associated effects of prey availability. The International Whaling Commission (IWC) has listed bowhead whales in the Eastern Arctic and Okhotsk Sea as "vulnerable" in part due to climate change.

The bowhead whale's foraging efficiency is intricately linked to the Arctic ecosystem and is affected by changes in ice cover, spring ice break-up, algal blooms, and in the abundance of its prey species. Spending their entire lives in Arctic waters, bowheads may be strongly affected by changes in the distribution or abundance of their prey in these areas. If plankton species are affected by global warming, this could lead to cascading effects through the food web. In addition, global warming and possible shifts in wind patterns could affect the distribution of polynyas. Dark polynyas often contain significant blooms of phytoplankton. Cetacean species such as bowhead whales that rely on ice edges for phytoplankton foraging might be adversely affected by any decline in these habitat areas.

Researchers and subsistence hunters are concerned that bowhead whales may also be impacted by other whale species migrating further northward, beyond their historical range, seeking colder waters. Large pods of gray whales typically travel to the Bering Sea's northern waters each spring from Baja, California, feasting on amphipods, tiny shrimp-like creatures that live in the muck at the bottom of the shallow sea. The gray whales feed voraciously all spring and summer in preparation for a three- to five-month fast during their 12,000-mile journey back to Baja in the fall.

However, now the gray whales are heading north into the Chukchi Sea, above the Arctic Circle, where the colder waters support amphipods. Some gray whales are foregoing their full fall migration, going no further south than Kodiak. It is unknown exactly what effect more gray whales in the northern seas year-round will have on bowhead whales. Both bowhead and gray whale populations are increasing at approximately 3% per year. Gray whales have a broader diet than bowheads, breed faster and generally seem more capable of colonizing new areas than bowhead whales. As the gray whales shift northward, they are moving closer to the territory of the bowhead whale, which feeds offshore on krill. Some Alaskan Native bowhead hunters are concerned that the more aggressive gray whale may interfere with the quieter bowhead, competing for habitat.

During the summers of 2006 and 2007, endangered humpback whales were seen swimming hundreds of miles north of their normal habitat with the whales seen north of the Bering Strait in the Chukchi Sea in 2006 and in the Beaufort Sea east of Barrow in 2007. Also seen in 2007 were endangered fin whales north of the Bering Strait in the Chukchi Sea near Point Lay. Humpback and fin whales are not associated with the ice pack ordinarily found in these waters but with the lowest ice pack on record, this area was ice-free. These whales also appear to be shifting their distribution into bowhead habitat, more than 300 miles north of their normal range in the Bering Sea.

Finally, seasonal changes in ice extent and increased human activity may restrict whale movements such that patterns of gene flow are altered. Bowhead whale migrations and selection of wintering and summering grounds may also shift in a warmer Arctic.

[illegible]

BOWHEAD WHALE APPENDIX

There are five known stocks of bowhead whales, found in:

- the Bering, Chukchi, and Beaufort Seas,[6] ;
- the Okhotsk Sea,
- the Hudson Bay area,
- the area between Canada and Greenland, and
- North of Europe.

Bowhead whales are the most important subsistence animal for most northwestern and northern Alaska coastal Eskimos. The International Whaling Commission (IWC), which manages the subsistence harvest of whales, has granted the Alaska Eskimo Whaling Commission a harvest quota. For 2008-2012, subsistence hunters received a block quota of 280 bowhead strikes, of which 67 whales (plus up to 15 unharvested in the previous year) could be taken annually. This quota allowed the Chukotka Natives in Russia to take 5 whales.

Prior to the 20th century, commercial whaling severely depleted all bowhead whale stocks. Before commercial whaling, the western Arctic stock was estimated at 10,400-23,000 whales. By 1986, when a moratorium on commercial whaling was established by the IWC, only approximately 1,000 to 3,000 animals remained. Since 1978, Alaska Eskimo whalers worked with NMFS to conduct systematic counts from sites on sea-ice north of Point Barrow during the whales' spring migration, resulting in higher abundance estimates. The National Marine Fisheries Service's 2005 stock assessment includes a 2001 abundance estimate of 10,545 whales,
a 3.5% to 4.9% rate of increase.

As a result of heavy exploitation by commercial whalers, the western Arctic bowhead whale stock is still listed as "endangered" under the Endangered Species Act and "depleted" under the Marine Mammal Protection Act. This stock of bowhead whales is the most studied stock in the world due to its importance to Alaska Natives for subsistence and the sub-sea location of oil and gas reserves below bowhead habitat. Research has produced reliable population estimates and trends as well as information about the whale's overall health, migration and stock structure.

---

[6] The National Marine Fisheries Service (NMFS) refers to this stock as the Western Arctic stock and the International Whaling Commission calls it the Bering-Chukchi-Beaufort (BCB) stock.

BOWHEAD WHALES

Bowheads are the only baleen whales that spend their entire lives in waters near sea-ice and do not migrate to temperate or tropical waters to calve. They have the thickest blubber of any marine mammal, up to 0.6 meters thick, which is used for insulation, food storage, and padding. Bowheads can be up to 18.3 meters long, with the females larger than the males. Their immense heads make up nearly one-third of their total body length. A bowhead whale's head is triangular in shape when viewed in profile, possibly an adaptation enabling the whale to break through ice in order to breathe. All seven neck vertebrae are fixed into a single unit to support the bowhead's enormous body weight. Bowhead whales were named for their high, arched upper jaws that somewhat resemble the shape of an archer's bow. Their mouths can be as long as 4.9 meters, as high as 3.7 meters, and as wide as 2.9 meters.

The baleen plates of bowheads are the longest of any baleen whale, exceeding 2.7 meters. Bowhead whales feed seasonally in the summer by filtering plankton, including tiny crustaceans like krill and copepods, from the water. These filter feeders swim slowly with their mouth open, constantly eating. On occasion, they are also bottom feeders.

Bowhead whales mature slowly, taking close to two decades to reach sexual maturity – a slower growth rate than other baleen whales. Females produce a calf once every three to four years, after a 13 to 14-month pregnancy. It is unknown until what age bowheads remain able to reproduce. The bowhead lifespan was once thought to be up to 70 years, but recent discoveries of antique ivory spear points in whales harvested by subsistence hunters have triggered further research, leading to the reliable conclusion that at least some individuals have lived to be 150–200 years old.

Bowhead whales are found only in the seasonally ice-covered waters of the Arctic and in the western Arctic basin, generally occurring north of 60 degrees N. latitude and south of 75 degrees N. latitude. They migrate annually from winter breeding areas in the northern Bering Sea through the Chukchi Sea in the spring and into the Canadian Beaufort Sea in the summer. The spring migration follows fractures in the sea-ice around the coast of Alaska, generally in the shear zone between the shorefast ice and the mobile polar pack ice. They depend on a system of open-water leads to provide a migratory route between wintering and summering grounds, but can also swim below the pack ice. In the fall, the bowheads return south along the same general route.

A Bowhead Whale (Balaena mysticetus) showing it's blowhole mound.

© MARINETHEMES.COM/KELVIN AITKEN

Conclusion

The ice-dependant marine mammals discussed in this report are suffering from the effects of global warming in a number of ways, including:

- Increased mortality of young due to lack of ice and/or shelter
- Reduced food availability
- Increased energy expenditure to locate food sources
- Greater exposure to predators
- Reduced body condition

The potential for increased human activity will further stress the Arctic ecosystem, negatively impacting these populations of animals.

Unless more drastic measures are enacted to reduce greenhouse gas emissions across the globe, we can expect substantial diminishment in populations and ultimately the extinction of some of the species discussed in this report within this century. Such a loss of species and biodiversity will have far reaching effects on the entire vast Arctic ecosystem, the subsistence and cultural use of these animals by Alaska Native peoples, and the natural environment we leave for future generations.

The U.S. Department of Interior (DOI) must meet its statutory deadline that requires a final listing determination to be made within one year of the January 9, 2007, publication of the proposed rule. Likewise, the federal government could propose that ice-dependent seal species and walruses receive the same listing status and habitat protections. Congress should increase government funding for research and stock assessments of ice-dependent marine mammals. Congress should also act swiftly to close the loophole in the Marine Mammal Protection Act that permits the importation of polar bear trophies hunted in Canada. Every governing body, in addition to the federal government, that has management authority over these species must also use its best efforts to find ways to protect them.

There are steps that individuals can take to reduce their own greenhouse gas emissions. These actions, though indirect, will help to improve the long-term survival of Arctic wildlife in the United States.

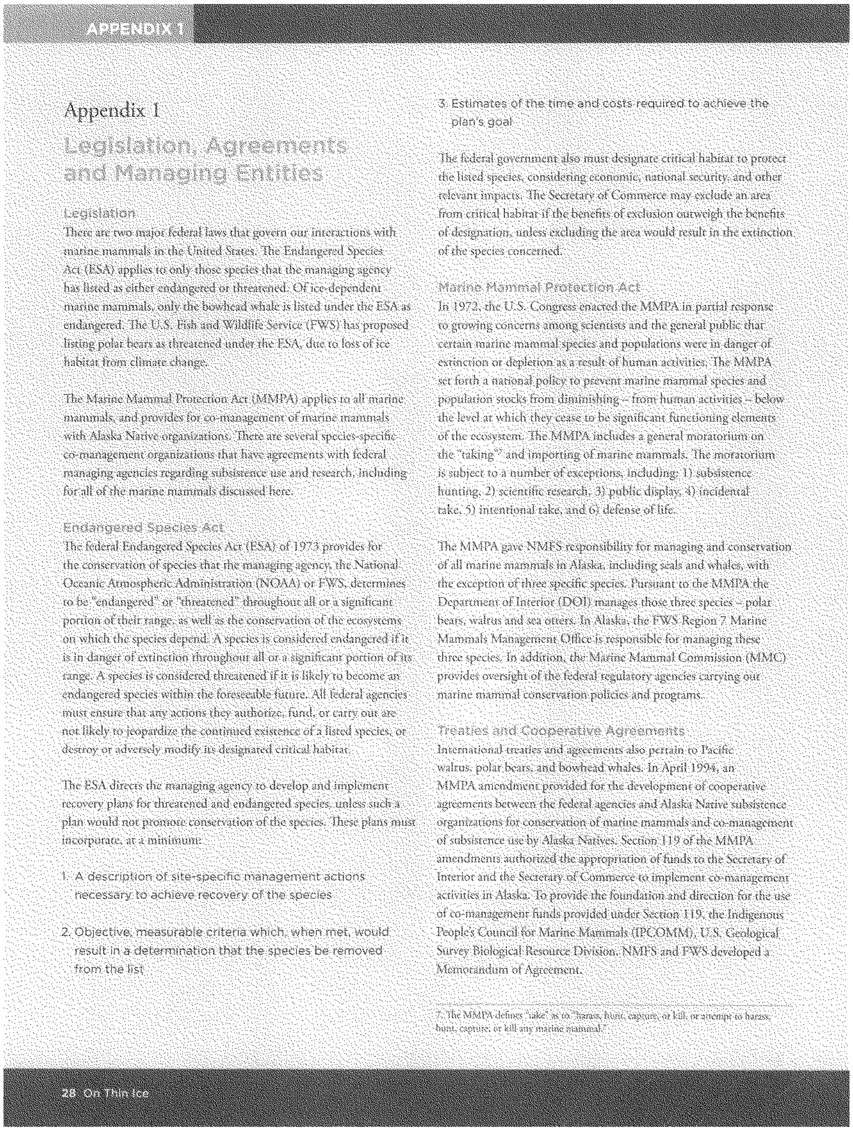
- Drive less. Walk, bike, take a bus, carpool and combine errands. Do whatever it takes to reduce your time driving.
- Reduce, reuse and recycle. It takes 70%-90% less energy to make recycled paper products than new ones.
- Use a push or electric mower. Gasoline mowers are one of biggest polluters in the neighborhood.
- Conserve hot water. Set your tank at about 120°F, take shorter showers, use water-efficient washing machines and wash clothes in cold water.
- Buy ENERGY STAR. Look for the ENERGY STAR label, an EPA rating system awarded to only the most energy-efficient appliances, computers, light fixtures and many other electrical conveniences.
- Turn down, turn off and unplug. Set thermostats at 68°F when you're home and 55°F or lower at night or when you're away. Turn off lights in empty rooms and use compact fluorescent bulbs in place of standard light bulbs. Unplug electronics such as TVs, DVD players and cell phone chargers that aren't in use.

Note on Research

There is a shortage of background information about almost all ice-dependent marine mammals. This can be attributed to the difficulty of studying animals in a very remote and extreme environment, as well as the expense of both physically accessing the animals and using the appropriate technology to survey them. With the exception of bowhead whales and the Southern Beaufort Sea polar bears, there are no reliable abundance estimates for the animals discussed in this report. Also, there is no information about population trends for these animals and no potential biological removal levels. Therefore, it is virtually impossible to discern the overall status of these marine mammal species, and how much loss of individual animals the populations can sustain.

It is critical that research is undertaken as soon as possible to collect reliable background abundance information, to monitor population trends, to identify sustainable take levels and to evaluate how human-caused and natural events are affecting the populations. In addition, as human activities increase in the Arctic it will become more important to monitor those activities for possible impacts on ice-dependent marine mammals, their prey, and their habitat in order to detect harmful changes as early as possible. Moreover, research is needed to understand the cumulative effects of all issues of concern -- global warming, oil and gas activities, contaminants, etc. -- on these animals to inform management actions and implement mitigation where possible.

The current level of financial support for such research limits informed decision-making about the status of Arctic marine mammals. Adequate funding is critical to support efforts by management agencies, their research collaborators and academic institutions to comprehensively survey and study ice-dependent marine mammals.



Appendix 1

Legislation, Agreements and Managing Entities

Legislation

There are two major federal laws that govern our interactions with marine mammals in the United States. The Endangered Species Act (ESA) applies to only those species that the managing agency has listed as either endangered or threatened. Of ice-dependent marine mammals, only the bowhead whale is listed under the ESA as endangered. The U.S. Fish and Wildlife Service (FWS) has proposed listing polar bears as threatened under the ESA, due to loss of ice habitat from climate change.

The Marine Mammal Protection Act (MMPA) applies to all marine mammals, and provides for co-management of marine mammals with Alaska Native organizations. There are several species-specific co-management organizations that have agreements with federal managing agencies regarding subsistence use and research, including for all of the marine mammals discussed here.

Endangered Species Act

The federal Endangered Species Act (ESA) of 1973 provides for the conservation of species that the managing agency, the National Oceanic Atmospheric Administration (NOAA) or FWS, determines to be "endangered" or "threatened" throughout all or a significant portion of their range, as well as the conservation of the ecosystems on which the species depend. A species is considered endangered if it is in danger of extinction throughout all or a significant portion of its range. A species is considered threatened if it is likely to become an endangered species within the foreseeable future. All federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species, or destroy or adversely modify its designated critical habitat.

The ESA directs the managing agency to develop and implement recovery plans for threatened and endangered species, unless such a plan would not promote conservation of the species. These plans must incorporate, at a minimum:

1. A description of site-specific management actions necessary to achieve recovery of the species
2. Objective, measurable criteria which, when met, would result in a determination that the species be removed from the list
3. Estimates of the time and costs required to achieve the plan's goal

The federal government also must designate critical habitat to protect the listed species, considering economic, national security, and other relevant impacts. The Secretary of Commerce may exclude an area from critical habitat if the benefits of exclusion outweigh the benefits of designation, unless excluding the area would result in the extinction of the species concerned.

Marine Mammal Protection Act

In 1972, the U.S. Congress enacted the MMPA in partial response to growing concerns among scientists and the general public that certain marine mammal species and populations were in danger of extinction or depletion as a result of human activities. The MMPA set forth a national policy to prevent marine mammal species and population stocks from diminishing – from human activities – below the level at which they cease to be significant functioning elements of the ecosystem. The MMPA includes a general moratorium on the "taking"[7] and importing of marine mammals. The moratorium is subject to a number of exceptions, including: 1) subsistence hunting, 2) scientific research, 3) public display, 4) incidental take, 5) intentional take, and 6) defense of life.

The MMPA gave NMFS responsibility for managing and conservation of all marine mammals in Alaska, including seals and whales, with the exception of three specific species. Pursuant to the MMPA the Department of Interior (DOI) manages those three species – polar bears, walrus and sea otters. In Alaska, the FWS Region 7 Marine Mammals Management Office is responsible for managing these three species. In addition, the Marine Mammal Commission (MMC) provides oversight of the federal regulatory agencies carrying out marine mammal conservation policies and programs.

Treaties and Cooperative Agreements

International treaties and agreements also pertain to Pacific walrus, polar bears, and bowhead whales. In April 1994, an MMPA amendment provided for the development of cooperative agreements between the federal agencies and Alaska Native subsistence organizations for conservation of marine mammals and co-management of subsistence use by Alaska Natives. Section 119 of the MMPA amendments authorized the appropriation of funds to the Secretary of Interior and the Secretary of Commerce to implement co-management activities in Alaska. To provide the foundation and direction for the use of co-management funds provided under Section 119, the Indigenous People's Council for Marine Mammals (IPCOMM), U.S. Geological Survey Biological Resource Division, NMFS and FWS developed a Memorandum of Agreement.

---

[7] The MMPA defines "take" as to "harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."

To facilitate co-management activities, there are cooperative agreements between the federal management agencies and the Ice Seal Committee, the Alaska Nanuuq (polar bear) Commission, the Eskimo Walrus Commission, and the Alaska Eskimo Whaling Commission. The cooperative agreements fund a wide variety of management issues, including:

- Commission of co-management operations
- Biological sampling programs
- Harvest monitoring
- Collection of Native traditional and ecological knowledge in management
- International coordination on management issues
- Cooperative enforcement of the MMPA
- Development of local conservation plans

Alaska Inupiat – Canadian Inuit Agreement: Southern Beaufort Sea Polar Bears

In 1988, the North Slope Borough Department of Wildlife Management (representing Alaska Inupiat people) and the Inuvialuit Game Council (representing Canadian Inuit people) signed an agreement to provide for coordinated management of the Beaufort Sea polar bear stock. Since the initiation of this local user agreement in 1988, the combined Alaska/Canada mean harvest from this stock has been 55.1 bears annually. From 1995-2000, the combined harvest of Southern Beaufort Sea polar bears was approximately 52, with the average Alaska harvest 32.2 and the Canadian harvest 19.6, from the same stock. In Alaska, the polar bear harvest is regulated by voluntary actions of local hunters provided that the population is not depleted.

The Alaska Nanuuq Commission

In 1994, the Alaska Nanuuq Commission was formed to represent the Alaska villages and hunters who harvest polar bears. In February 1997, the Nanuuq Commission and FWS signed a Cooperative Agreement for the Conservation of Polar Bears in Alaska pursuant to section 119 of the MMPA for the co-management of polar bears. The current agreement includes feeding ecology studies on the North Slope, public education, predator-prey studies, contaminant assessment, human-bear interactions and cooperation with the Natives of Chukotka in Russia on the conservation of the shared polar bear population. The Nanuuq Commission also has a cooperative agreement with the National Park Service Beringian Heritage Program for polar bear studies in Chukotka and with the National Marine Fisheries Service for studies on ice seals, the primary prey for polar bears.

Harvest levels of the Chukchi/Bering Seas stock by Alaska Natives has been in decline. From more than 100 in the early to mid 1900s, the 1996-2000 mean harvest was 44.8 bears. It is believed that there is substantial poaching going on by Russian Natives, of approximately 200 bears a year. The Alaska Nanuuq Commission is also developing a Native to Native Agreement with the Association of Traditional Marine Mammal Hunters of Chukotka to manage the subsistence harvest of polar bears and to assign quotas.

2000 U.S. Russia Treaty on Polar Bears

In October 2000, the United States and Russia signed a bilateral agreement for population and habitat conservation of the Chukchi/Bering Seas stock. The treaty sets quotas on polar bear hunting by Native populations in the two countries and establishes a bilateral commission to analyze how best to sustain the polar bear habitat. The Alaska Nanuuq Commission was instrumental in developing this agreement that identifies a central role for Native people in future implementation. The treaty is unique in that it allows representatives of Alaska Natives and the Natives of Chukotka to sit with their respective federal government agencies on a joint commission which will set harvest limits on the shared polar bear population in the Bering and Chukchi Seas. Since the U.S. Congress passed legislation in December 2006 to authorize regulation and harvest management of Chukchi bears, both governments are now able to move forward in implementing the treaty.

Ice Seal Committee

Because of the importance of ice seals to Alaska Natives as a source of food and clothing, and to polar bears as prey, the Ice Seal Committee of the Alaska Nanuuq Commission was formed to manage and conserve ice seal populations. The Ice Seal Committee is made up of subsistence seal hunters who represent five different regions that span the coast of Alaska from Bristol Bay to the Canadian border. The Ice Seal Committee helps NMFS manage the four ice seal species through research and education, and the two entities have an agreement to co-manage Alaskan ice seal populations.

Eskimo Walrus Commission

The Eskimo Walrus Commission (EWC) was formed in 1978 as a consortium of Native hunters concerned with the health of walrus and other marine mammal populations; nineteen communities are EWC members.[8] The EWC has taken an active role in the management and research of walrus at the local, state, national and international levels. In 1997, FWS and EWC signed a cooperative agreement to encourage subsistence hunters to participate in conserving and managing walrus stocks in coastal communities. In 1998, a memorandum of understanding between FWS, EWC, and Alaska Department of Fish & Game was signed, allowing joint management of the Pacific Walrus Conservation Fund. The majority of the funds come from the sale of raw ivory by the EWC during state conferences and events.

EWC works cooperatively with FWS on a number of projects:

- Conducting an annual walrus harvest monitoring project to gather information about the size and composition of the annual subsistence walrus harvest in Alaska
- Conducting biannual meetings of commission members who represent the 19 communities
- Monitoring subsistence walrus hunts on Round Island with Bristol Bay Native Association's Qayassiq Walrus Commission in Bristol Bay
- Collecting detailed walrus harvest data and biological samples in five communities
- Recording general walrus harvest data through the federally mandated marking, tagging, and reporting program
- Working through a cooperative agreement between U.S. and Russian governments with all Chukotkan Native coastal communities in the harvest, conservation and management of the Pacific walrus
- Gathering culture-based traditional knowledge
- Working with communities to become more proactive in co-management of the walrus population

While the subsistence walrus harvest in Alaska is fairly well documented, Russian harvest estimates are no longer considered accurate or reliable. Since 1999, the FWS and the EWC have sponsored a walrus harvest monitoring project in Chukot, collaborating with organizations in Chukotka, Russia. The project collects walrus harvest information from the eight primary walrus hunting villages in Chukotka, using local Native harvest monitors. Each spring American and Russian representatives meet in Nome, Alaska, to exchange harvest data and discuss pertinent walrus conservation and management issues.

International Whaling Commission

The International Whaling Commission (IWC) is an intergovernmental commission that is responsible for implementing the 1946 International Convention for the Regulation of Whaling (ICRW). Membership is open to any country which formally adheres to the ICRW. Each country is represented by a commissioner who votes every three years to elect the Chairman and Vice-Chairman. The IWC's explicit objectives are to provide for "the proper conservation of whale stocks and the orderly development of the whaling industry." The IWC's main duty is to review and revise the measures provided in the schedule to the convention which govern the conduct of whaling throughout the world. The IWC can also require catch reporting and other statistical and biological records. In addition, the IWC encourages, coordinates and funds whale research, publishes the results of these and other scientific research and promotes studies into related matters such as the humaneness of the killing operations.

In 1982, the IWC agreed to implement, beginning with the 1985-1986 season, an international moratorium on commercial whaling worldwide.[9] It issues separate quotas for aboriginal subsistence whaling in Denmark (Greenland – fin and minke whales), the Russian Federation (Siberia – gray and bowhead whales), St. Vincent and The Grenadines (humpback whales) and the United States (Alaska – bowhead whales; gray whales by the Makah in the State of Washington).

---

[8] The communities include Barrow, Brevig Mission, Clarks Point, Gambell, Kivalina, King Island, Kotzebue, Kwigillingok, Little Diomede, Mekoryuk, Nome, Point Hope, Point Lay, Savoonga, Shishmaref, Stebbins, Unalakleet, Wainwright, and Wales.

[9] Norway lodged a formal objection to the zero catch limits set in 1985/86 and is thereby not bound by them. It has recently resumed commercial whaling, setting its own catch limits on the basis of the IWC Management Procedure.

As part of their response to the decision to stop commercial whaling, some member governments have implemented scientific research programs including the sampling of whales caught under special permits which the Convention allows them to grant. Japan is taking close to 1,000 whales each year in both the Antarctic and the North Pacific under this provision. Norway and Iceland have also issued permits under their scientific programs in the past.

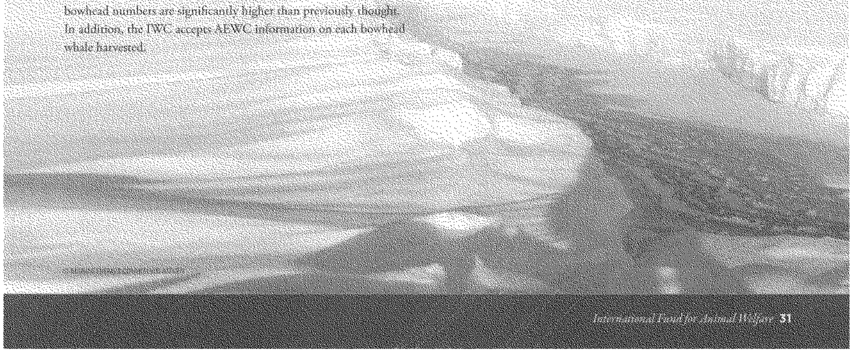
Alaska Eskimo Whaling Commission

The AEWC is made up of the registered whaling captains and their crew members from each of the ten whaling communities in Alaska: Gambell, Savoonga, Wales, Little Diomede, Kivalina, Point Hope, Wainwright, Barrow, Nuiqsut, and Kaktovik. The registered whaling captains are voting members and crew members are non-voting members. The AEWC is directed by a ten-member board (one from each whaling village).

The AEWC was formed after the IWC voted in 1977 to ban the Alaska Eskimo subsistence bowhead whale harvest based on inaccurate population estimates from U.S. government scientists that there was an alarmingly low number of bowheads. The government had not consulted with the Eskimos in determining the population estimate or in communicating with the IWC. Ultimately, the IWC approved a limited quota of 18 strikes for the 1978 bowhead whale harvest across the 10 AEWC member villages. The AEWC communities agreed to abide by the IWC quota until research proved that the Eskimos' estimates of the bowhead population were correct. The North Slope Borough Department of Wildlife Management took the primary responsibility for estimating the population. The AEWC agreed to cooperate fully with federal research efforts. Since 1978, the AEWC has cooperated in bowhead whale surveys.

In March 1981, NOAA substantially delegated authority to the AEWC to manage the subsistence hunt and to enforce regulations imposed on that hunt by entering into a cooperative agreement. AEWC adopted a management plan to improve the efficiency of the subsistence hunt and to educate people about the importance of the bowhead whale to the whaling communities. The AEWC determines the allocation of IWC permitted strikes among the whaling villages. The management plan provides that the meat and edible products of bowhead whales taken in the subsistence hunt are used exclusively for Native consumption and may not be sold.

As a result of AEWC's census work, the long-standing observations of Eskimo whalers have been corroborated and the IWC accepts that bowhead numbers are significantly higher than previously thought. In addition, the IWC accepts AEWC information on each bowhead whale harvested.



Appendix 2

IFAW POSITION STATEMENT: Climate Change and Marine Mammals

Statement of Position:
Climate change, especially global warming, has profound implications for marine mammals.[10] Adverse effects on the welfare of individuals have already been observed, as have significant impacts on marine mammal populations and their habitats.

In recognition of the magnitude of this threat, IFAW urges policy makers to adopt the strictest precautionary measures in all policies and decisions affecting the welfare and conservation of marine mammals. IFAW favors mandatory programs to reduce the build up of greenhouse gases and encourages individuals to understand how their daily choices impact global warming and therefore have a direct impact on the welfare of marine mammals.

Explanatory Notes:

1. Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level (International Panel on Climate Change (IPCC) 2007).

2. Global climate change, including global warming, has profound implications for all living organisms, including humans (e.g. IPCC 2001). Future impacts are difficult to predict precisely, however, because the interactive effects of climate and ocean processes are complex. Nonetheless, it is clear that rapid human-induced global warming poses profound risks for the welfare and long-term survival of many marine mammals (e.g. Robinson *et al.* 2005).

3. Included among the impacts observed or suggested for marine mammals are: changes in the timing of migration and breeding; changes in, or loss of, haulout sites (e.g. some seals) because of rising sea levels; increased mortality in certain locations or years (e.g. polar bears, harp seals); reduced reproductive success (e.g. southern right whales); changes in the distribution and abundance of important prey species, competitors and predators; and changes in population distribution patterns or ranges (e.g. Leaper *et al.* 2006, Robinson *et al.* 2005, Johnston *et al.* 2005).

4. Ocean processes influence, and are influenced by, climatic changes (including global warming). The oceans have experienced climatic fluctuations in the past within the ranges that are currently occurring. The differences today are that the rapid rate of global warming is unprecedented, and that human activities are a major contributor (e.g. IPCC 2001). Complex interactions between climate and ocean processes create significant environmental change impacting:

   - temperature
   - salinity
   - acidity
   - ocean circulation
   - currents
   - sea levels
   - sea-ice cover and thickness
   - distribution and migration patterns, and
   - abundances of marine mammals and their prey.

   Such impacts can in turn affect the nutritional status, reproductive success, and survivorship of marine mammals (e.g. Robinson *et al.* 2005).

5. While it is difficult or sometimes impossible to make precise predications about the impacts of climate change on both marine mammals and their habitats, in recognition of the potential impacts, IFAW will continue to advocate that management authorities incorporate environmental uncertainty into management plans and make management decisions based on the precautionary principle, especially when the species in question are subject to direct killing (e.g. harp and hooded seals, grey seals, walruses, polar bears); incidental killing such as entanglement in fishing gear (e.g. harbour porpoises); disturbances to habitats (e.g. monk seals); exposure to toxic pollutants; exposure to active sonar and other harmful underwater noise pollution; and collisions with ships (right whales).

---

[10] For the purposes of this statement, "marine mammals" include: cetaceans (whales, dolphins and porpoises), pinnipeds (fur seals, sea lions, walrus, and true seals), sirenians (manatees and dugongs), sea otters and polar bears.

Sources:

IPCC 2007 Climate Change 2007: Synthesis Report. Summary for Policymakers. Available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

IPCC 2001. Climate Change 2001: Synthesis Report. Summary for Policymakers. An Assessment of the Intergovernmental Panel on Climate Change. 34pp. Available at: http://www.ipcc.ch/pub/un/syreng/spm.pdf. Accessed 16 November 2007.

Johnston, D.W., A.S. Friedlaender, L.G. Torres, and D.M. Lavigne. 2005. Variation in sea-ice cover on the east coast of Canada from 1969 to 2002: climate variability and implications for harp and hooded seals. Climate Research 29: 209-222.

Leaper, R., J. Cooke, P. Trathan, K. Reid, V. Rowntree, and R. Payne. 2006. Global climate drives southern right whale *(Eubalaena australis)* population dynamics. Biology Letters 2(2): 289-292. The Royal Society.

Robert A. Robinson, Jennifer A. Learmonth, Anthony M. Hutson, Colin D. Macleod, Tim H. Sparks, David I. Leech, Graham J. Pierce, Mark M. Rehfisch & Humphrey Q.P. Crick. 2005. Climate Change and Migratory Species. BTO Research Report 414. Published in August 2005 by the British Trust for Ornithology, The Nunnery, Thetford, Norfolk, IP24 2PU, UK. 308pp. Available at: http://www.bto.org/research/reports/researchrpt_complete/RR414_Climate%20change_&_migratory_species.pdf. Accessed 16 November 2007.

© MARINETHEMES.COM/JOHN MCLENNAN

Appendix 3

Source Materials

In order to make this report as readable as possible, we did not include literature citations throughout the text. Readers who want additional information may wish to consult some of the many documents that were used in the preparation of this report. These are listed below, first for the Introduction, and then for each of the Alaska marine mammals covered in the report.

Introduction

Angliss, R.P. and R.B. Outlaw. Alaska Marine Mammal Stock Assessments, 2005. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-AFSC-161. 250 p. (www.nmfs.noaa.gov/pr/pdfs/sars/ak2005.pdf).

Arctic Climate Impact Assessment. 2004. Impacts of a warming climate. Cambridge University Press, Cambridge, United Kingdom.

Arctic Environmental Observatory (http://arctic.bio.utk.edu/Marine_mammals/index.html).

Bradner, T., December 31, 2005. "Interest heats up over Chukchi Sea prospects." Alaska Journal of Commerce. (www.alaskajournal.com/stories/010106/hom_20060101016.shtml)

California Climate Change Policy and Programs (http://www.climatechange.ca.gov/policies/index.html).

Contaminants in Alaska. Is America's Arctic at Risk? Interagency Collaborative Paper. September 2000.

Endangered and Threatened Wildlife and plants; 12-Month petition Finding and Proposed Rule to List the Polar Bear (Ursus maritimus) as Threatened Throughout Its Range, 72 Fed. Reg. 1063 (January 9, 2007).

EPA State and Regional Climate Actions Table (http://www.epa.gov/climatechange/wycd/stateandlocalgov/state_actionslist.html#state).

Fourth Assessment Report. IPCC (http://www.ipcc.ch/SPM2feb07.pdf).

Kucklick, J.R., Krahn, M.M. Becker, P.R. Porter, B.J., Schantz, M.M., York, G.S., O'Hara, T.M., Wise, S.A. 2006. Persistent organic pollutants in Alaskan ringed seal (Phoca hispida) and walrus (Odobenus rosmarus) blubber. J. Environ. Monit., 8, 848-856.

Lowry, L.F. 2000. Marine mammal-sea-ice relationships. Pp. 91-96 in H.P. Huntington (ed.), Impacts of changes in sea-ice and other environmental parameters in the Arctic. Report of the Marine Mammal Commission Workshop, Girdwood, Alaska, 15-17 February 2000.

Loy, Wesley. "Conoco disputes sonic test regulation" Anchorage Daily News. September 16, 2006 (www.adn.com/money/industries/oil/story/8199352p-8093193c.html).

Macdonald, R.W., T. Harner, and J. Fyfe. 2005. Recent climate change in the Arctic and its impact on contaminant pathways and interpretation of temporal data. Science of the Total Environment 342:5-86.

Macdonald, R.W., 2005. Climate Change, Risks and Contaminants: A Perspective from Studying the Arctic. Human and Ecological Risk Assessment. Volume 11, Number 6. pp. 1099-1104.

Minerals Management Service Alaska OCS Region. Alaska Annual Studies Plan Final FY 2007. September 2006.

Minerals Management Service Alaska OCS Region. Final Programmatic Environmental Assessment Arctic Ocean Outer Continental Shelf Seismic Surveys – 2006.

Minerals Management Service, Environmental Assessment Proposed OCS Lease Sale 202. Beaufort Sea Planning Area. July 2006. p. 38.

Minerals Management Service, Outer Continental Shelf Oil and Gas Leasing Program: 2007-2012. Draft Environmental Impact Statement Five Year Plan. July 2006.

Minerals Management Service, Proposed Program Outer Continental Shelf Oil and Gas Leasing Program: 2007-2012. August 2006.

Simpkins, M.A., L.M. Hiruki-Raring, G. Sheffield, J.M. Grebmeier and J.L.Bengtson. 2003. Habitat selection by ice-associated pinnipeds near St. Lawrence Island, Alaska in March 2001. Polar Biology. 26:577-586.

U.S. Conference of Mayors on Climate Protection Page (hwww.usmayors.org/climateprotection).

Ice seals

Alaska Department of Fish and Game. 2000. Seals Database for Access 97. Division of Subsistence, Anchorage.

Alaska Nanuuq Commission, Ice Seal Committee (http://www.nanuuq.info/iceseal.html).

Alaska Nanuuq Commission, Peard Bay Alaska 2005 Ringed Seal Project (http://www.nanuuq.info/peardbay.html).

Angliss, R.P. and R.B. Outlaw, eds., National Marine Mammal Laboratory, NMFS, Draft Alaska Marine Mammal Stock Assessments 2006 (spotted seals, pp. 57-62; bearded seals, pp. 63-67; ringed seals, pp. 68-72; ribbon seals, pp. 73-76) (http://www.nmfs.noaa.gov/pr/pdfs/sars/ak2006_draft.pdf).

Bengston, J. L., L.M. Hiruki-Raring, M.A. Simpkins, and P.L. Boveng, NMML, NMFS, "Ringed and bearded seal densities in the eastern Chukchi Sea, 1999-2000" (http://nmml.afsc.noaa.gov/PolarEcosyst/PEPsealDensities.htm).

Bengtson, J.L. 2005. Ringed and bearded seal densities in the eastern Chukchi Sea, 1999-2000. *Polar Biology* 28(11) (http://nmml.afsc.noaa.gov/PolarEcosyst/PEPsealDensities.htm).

Burns, John J., Alaska Department of Fish and Game Wildlife Notebook Series, "Bearded Seal" (1994) (http://www.adfg.state.ak.us/pubs/notebook/marine/brd-seal.php).

Burns, John J., Alaska Department of Fish and Game Wildlife Notebook Series, "Ribbon Seal" (1994) (http://www.adfg.state.ak.us/pubs/notebook/marine/rib-seal.php).

Burns, John J., Alaska Department of Fish and Game Wildlife Notebook Series, "Spotted Seal" (1994) http://www.adfg.state.ak.us/pubs/notebook/marine/spt-seal.php).

Cameron, Michael, National Marine Mammal Lab, NMFS, Polar Ecosystems Program. Habitat Use and Seasonal Movements of Ribbon Seals in the Bering Sea and North Pacific (http://www.afsc.noaa.gov/Quarterly/amj2005/divrptsNMML5.htm).

Dehn, L.A., Sheffield, G.G., Follman, E.H., Duffy, C.K., Thomas, D.L., O'Hara, T.M., 2006. Feeding Ecology of Phocid Seals and Some Walrus in the Alaskan and Canadian Arctic as Determined by Stomach Contents and Stable Isotope Analysis, Polar Biology.

Dehn, L.A., Sheffield, G.G., Follmann, E.H., Duffy, L.K., Thomas, D.L., Bratton, G.R., Taylor, R.J., O'Hara, T.M., 2005. Trace elements in tissues of phocid seals harvested in the Alaskan and Canadian Arctic: influence of age and feeding ecology. 746 Can. J. Zool. Vol. 83.

Elvey Jr., Thomas. Alaska Department of Fish and Game Wildlife Notebook Series, "Ringed Seal" (1994) (http://www.adfg.state.ak.us/pubs/notebook/marine/rin-seal.php).

Frost, K.J., L.F. Lowry, G. Pendleton, and H.R. Nute. 2002. Monitoring distribution and abundance of ringed seals in northern Alaska. OCS Study MMS 2002-04. Final report from the Alaska Department of Fish and Game, Juneau, AK, for the U.S. Minerals Management Service, Anchorage, AK 66 pp. + Appendices.

Ice Seal Committee Co-Management Agreement with NMFS, (www.nanuuq.info/Documents/IceSealAgreement_Draft_2006.htm).

Joling, D., February 26, 2007. "Melting snow lairs put seal pups in peril," Anchorage Daily News.

Kelly, B.P. 1988. Bearded seal, *Erignathus barbatus*. Pp. 77-94 *In* J.W. Lentfer (ed.). Selected marine mammals of Alaska. Species accounts with research and management recommendations. Marine Mammal Commission, Washington, D.C.

Kelly, B.P. 1988. Ribbon seal, *Phoca fasciata*. Pp. 96-106 *In* J.W. Lentfer (ed.). Selected marine mammals of Alaska. Species accounts with research and management recommendations. Marine Mammal Commission, Washington, D.C.

Kelly, B.P. 1988. Ringed seal, *Phoca hispida*. Pp. 57-75 *In* J.W. Lentfer (ed.). Selected marine mammals of Alaska. Species accounts with research and management recommendations. Marine Mammal Commission, Washington, D.C.

Kelly, B.P. 2001. Climate Change and Ice Breeding Pinnipeds. Pp. 43-55 *In* Walther et al. (ed.) "Fingerprints" of Climate Change. Kluwer Academic/Plenum Publishers, New York.

Kotzebue IRA Current Projects , Kotzebue Sound Bearded Seal Satellite Tagging Project (http:/kotzebueira.org/current_projects.html).

Kucklick, J.R., Krahn, M.M., Becker, P.R., Porter, B.J., Schantz, M.M., York, G.S., O'Hara, T.M., Wise, S.A. 2006. Persistent organic pollutants in Alaskan ringed seal (Phoca hispida) and walrus (Odobenus rosmarus) blubber, J. Environ. Monit., 8, 848-856.

Kucklick, J.R., Struntz, W.D.J., Becker, P.R., York, G.W., O'Hara, T.M., Bohonowych, J.E., 2002. Persistent organochlorine pollutants in ringed seals and polar bears collected from northern Alaska. The Science of the Total Environment, 287, 45-59.

National Marine Mammal Laboratory, "Arctic Ice Seals" (http://nmml.afsc.noaa.gov/PolarEcosyst/arctic.htm).

NMFS News Release, "Labrador Retrievers Assist Ringed Seal Researchers," April 11, 2006 (http://www.fakr.noaa.gov/newsreleases/ringedseal041106.htm).

North Pacific Research Board, Semi-Annual Progress Reports, Project # R0312, Ice Seal Bio-Monitoring in the Bering-Chukchi Sea Region, July 2003, January 2004, July 2004, January 2005, July 2005, January 2006 (http://project.nprb.org/view.jsp?id=af3e0be1-a9a6-4fde-ba06-0faca591f449).

North Pacific Research Board, Semi-Annual Progress Reports, Project # F0515, Ice Seal Movements and Stock Structure in a Changing Cryosphere, July 12, 2005, March 2006, July 2006, (http://project.nprb.org/view.jsp?id=5478c509-e849-4ccf-924b-2f8626758ab2).

O'Corry-Crowe, G.M. and Westlake, R.L. (1997) Molecular Investigations of spotted seals *(Phoca largha)* and harbor seals *(P. vitulina)*, and their relationships in areas of sympatry. *In* Molecular Genetics of Marine Mammals. (A.E. Dizon, S.J. Chivers and W.F. Perrin, eds.). The Society of Marine Mammalogy, Special Publication 3: 291-304.

Perez, N.A. In review. Analysis of marine mammal bycatch data from the trawl, longline, and pot groundfish fisheries of Alaska, 1998-2004, defined by geographic area, gear type, and target groundfish species. NOAA Tech. Memo. NMFS-AFSC-xxx.

Quakenbush, L., L. Hughes, and G. Sheffield. 2005. Organochlorine contaminants in ice seal blubber from the Bering Sea subsistence harvest in Alaska. Alaska Society of American Foresters and Alaska Chapter of the Wildlife Society 2nd Annual Joint Meeting, 21-23 April, Fairbanks, AK. (Abstract)

Seal Conservation Society, Bearded Seals (http://www.pinnipeds.org/species/bearded.htm).

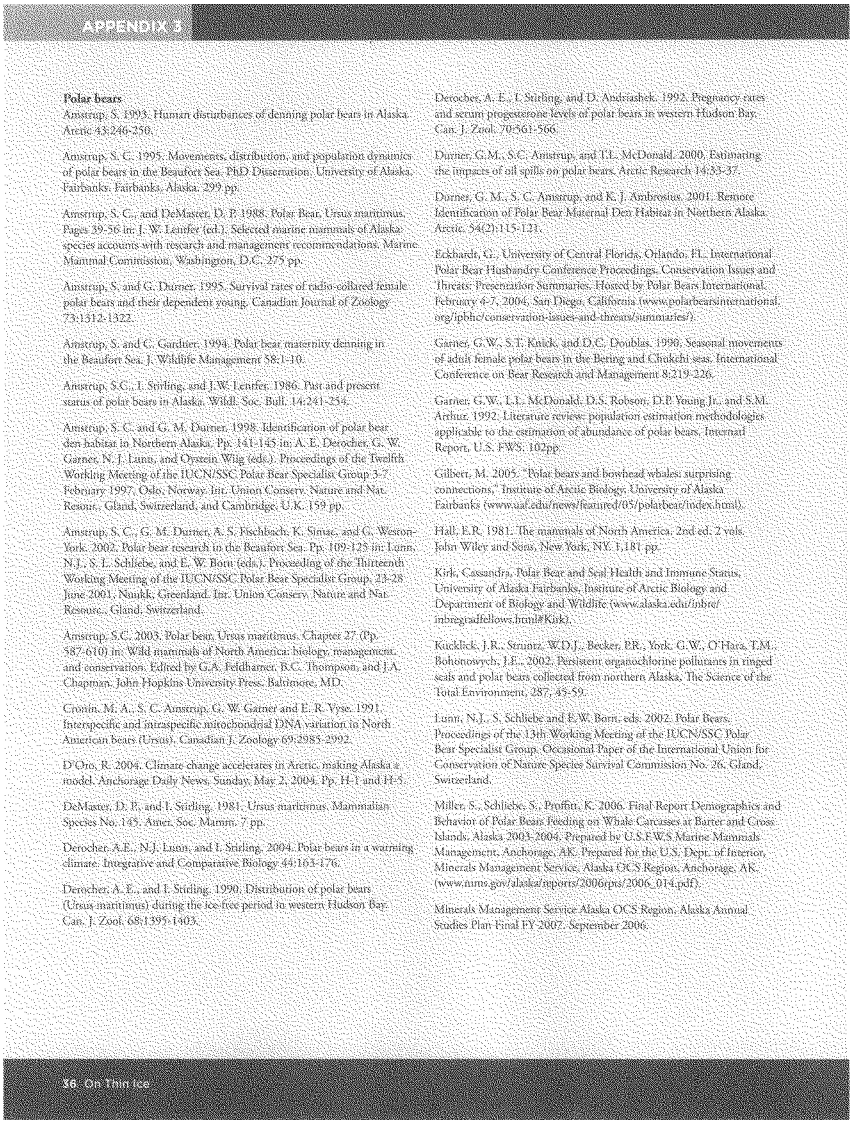
Seal Conservation Society, Ribbon Seals (http://www.pinnipeds.org/species/ribbon.htm).

Seal Conservation Society, Ringed Seals (http://www.pinnipeds.org/species/ringed.htm).

Seal Conservation Society, Spotted Seals (http://www.pinnipeds.org/species/spotted.htm).

Simpkins, M. A., L. M. Hiruki-Raring, G. Sheffield, J. M. Grebmeier, and J. L. Bengtson.

2003. Habitat selection by ice-associated pinnipeds near St. Lawrence Island, Alaska. Polar Biology 26(9): 577-586 (http://dx.doi.org/10.1007/s00300-003-0527-7).



Polar bears

Amstrup, S. 1993. Human disturbances of denning polar bears in Alaska. Arctic 43:246-250.

Amstrup, S. C. 1995. Movements, distribution, and population dynamics of polar bears in the Beaufort Sea. PhD Dissertation. University of Alaska, Fairbanks. Fairbanks, Alaska. 299 pp.

Amstrup, S. C., and DeMaster, D. P. 1988. Polar Bear, Ursus maritimus. Pages 39-56 in: J. W. Lentfer (ed.). Selected marine mammals of Alaska: species accounts with research and management recommendations. Marine Mammal Commission, Washington, D.C. 275 pp.

Amstrup, S. and G. Durner. 1995. Survival rates of radio-collared female polar bears and their dependent young. Canadian Journal of Zoology 73:1312-1322.

Amstrup, S. and C. Gardner. 1994. Polar bear maternity denning in the Beaufort Sea. J. Wildlife Management 58:1-10.

Amstrup, S.C., I. Stirling, and J.W. Lentfer. 1986. Past and present status of polar bears in Alaska. Wildl. Soc. Bull. 14:241-254.

Amstrup, S. C. and G. M. Durner. 1998. Identification of polar bear den habitat in Northern Alaska. Pp. 141-145 in: A. E. Derocher, G. W. Garner, N. J. Lunn, and Oystein Wiig (eds.). Proceedings of the Twelfth Working Meeting of the IUCN/SSC Polar Bear Specialist Group 3-7 February 1997, Oslo, Norway. Int. Union Conserv. Nature and Nat. Resour., Gland, Switzerland, and Cambridge, U.K. 159 pp.

Amstrup, S. C., G. M. Durner, A. S. Fischbach, K. Simac, and G. Weston-York. 2002. Polar bear research in the Beaufort Sea. Pp. 109-125 in: Lunn, N.J., S. L. Schliebe, and E. W. Born (eds.). Proceeding of the Thirteenth Working Meeting of the IUCN/SSC Polar Bear Specialist Group, 23-28 June 2001, Nuukk, Greenland. Int. Union Conserv. Nature and Nat. Resourc., Gland, Switzerland.

Amstrup, S.C. 2003. Polar bear, Ursus maritimus. Chapter 27 (Pp. 587-610) in: Wild mammals of North America: biology, management, and conservation. Edited by G.A. Feldhamer, B.C. Thompson, and J.A. Chapman. John Hopkins University Press, Baltimore, MD.

Cronin, M. A., S. C. Amstrup, G. W. Garner and E. R. Vyse. 1991. Interspecific and intraspecific mitochondrial DNA variation in North American bears (Ursus). Canadian J. Zoology 69:2985-2992.

D'Oro, R. 2004. Climate change accelerates in Arctic, making Alaska a model. Anchorage Daily News, Sunday, May 2, 2004. Pp. H-1 and H-5.

DeMaster, D. P., and I. Stirling. 1981. Ursus maritimus. Mammalian Species No. 145. Amer. Soc. Mamm. 7 pp.

Derocher, A.E., N.J. Lunn, and I. Stirling. 2004. Polar bears in a warming climate. Integrative and Comparative Biology 44:163-176.

Derocher, A. E., and I. Stirling. 1990. Distribution of polar bears (Ursus maritimus) during the ice-free period in western Hudson Bay. Can. J. Zool. 68:1395-1403.

Derocher, A. E., I. Stirling, and D. Andriashek. 1992. Pregnancy rates and serum progesterone levels of polar bears in western Hudson Bay. Can. J. Zool. 70:561-566.

Durner, G.M., S.C. Amstrup, and T.L. McDonald. 2000. Estimating the impacts of oil spills on polar bears. Arctic Research 14:33-37.

Durner, G. M., S. C. Amstrup, and K. J. Ambrosius. 2001. Remote Identification of Polar Bear Maternal Den Habitat in Northern Alaska. Arctic. 54(2):115-121.

Eckhardt, G., University of Central Florida, Orlando, FL. International Polar Bear Husbandry Conference Proceedings. Conservation Issues and Threats: Presentation Summaries. Hosted by Polar Bears International. February 4-7, 2004, San Diego, California (www.polarbearsinternational.org/ipbhc/conservation-issues-and-threats/summaries/).

Garner, G.W., S.T. Knick, and D.C. Doublas. 1990. Seasonal movements of adult female polar bears in the Bering and Chukchi seas. International Conference on Bear Research and Management 8:219-226.

Garner, G.W., L.L. McDonald, D.S. Robson, D.P. Young Jr., and S.M. Arthur. 1992. Literature review: population estimation methodologies applicable to the estimation of abundance of polar bears. Internatl Report, U.S. FWS. 102pp.

Gilbert, M. 2005. "Polar bears and bowhead whales: surprising connections," Institute of Arctic Biology, University of Alaska Fairbanks (www.uaf.edu/news/featured/05/polarbear/index.html).

Hall, E.R. 1981. The mammals of North America. 2nd ed. 2 vols. John Wiley and Sons, New York, NY. 1,181 pp.

Kirk, Cassandra, Polar Bear and Seal Health and Immune Status, University of Alaska Fairbanks, Institute of Arctic Biology and Department of Biology and Wildlife (www.alaska.edu/inbre/inbregradfellows.html#Kirk).

Kucklick, J.R., Struntz, W.D.J., Becker, P.R., York, G.W., O'Hara, T.M., Bohonowych, J.E., 2002. Persistent organochlorine pollutants in ringed seals and polar bears collected from northern Alaska, The Science of the Total Environment, 287, 45-59.

Lunn, N.J., S. Schliebe and E.W. Born, eds. 2002. Polar Bears. Proceedings of the 13th Working Meeting of the IUCN/SSC Polar Bear Specialist Group. Occasional Paper of the International Union for Conservation of Nature Species Survival Commission No. 26, Gland, Switzerland.

Miller, S., Schliebe, S., Proffitt, K. 2006. Final Report Demographics and Behavior of Polar Bears Feeding on Whale Carcasses at Barter and Cross Islands, Alaska 2003-2004. Prepared by U.S.F.W.S Marine Mammals Management, Anchorage, AK. Prepared for the U.S. Dept. of Interior, Minerals Management Service, Alaska OCS Region, Anchorage, AK. (www.mms.gov/alaska/reports/2006rpts/2006_014.pdf).

Minerals Management Service Alaska OCS Region, Alaska Annual Studies Plan Final FY 2007. September 2006.

Nageak, B.P., C.D.N. Brower, and S.L. Schliebe. 1991. Polar bear management in the southern Beaufort Sea: An Agreement between the Inuvialuit Game Council and the North Slope Borough Fish and Game Committee. *In* Transactions of North American Wildlife and Natural Resources Conference. 56:337-345.

Perham, C.J. 2005. Proceedings: Beaufort Sea Polar Bear Monitoring Workshop. OCS Study MMS 2005-034. Prepared by UFWS Marine Mammals Management, Anchorage, AK. Prepared for the U.S. Dept. of Interior, Minerals Management Service, Alaska OCS Region. Anchorage, AK. 26 pp. plus appendices (http://www.mms.gov/alaska/reports/2005rpts/2005_034.pdf).

Polar Bear Specialist Group, IUCN Species Survival Commission (http://pbsg.npolar.no/).

Reeves, R. R., B. S. Stewart, and S. Leatherwood. 1992. The Sierra Club Handbook of Seals and Sirenians. Sierra Club Books, San Francisco, California. xvi + 359 pp.

Schliebe, S.L., J.W. Bridges, T.J. Evans, A.S. Fishbach, S.B. Kalxdorff, and L.J. Lierheimer. 2002. Summary of polar bear management in Alaska. In: Lunn, S. Schliebe, and E. Born (eds). Proceedings of the 13th Working Meeting of the IUCN/SCC Polar Bear Specialist Group. 23-28 June 2001. International Union for the Conservation of Nature and Natural Resources, Nuuk, Greenland.

Schliebe, S.L., What has happened to polar bears in recent years? NOAA Arctic Theme Page (http://www.arctic.noaa.gov/essay_schliebe.html).

Schoen, J.W. and S.E. Senner (eds.). 2002. Alaska's Western Arctic, a summary and synthesis of resources. Draft. December 2002. Audubon Alaska. Anchorage, AK.

Stirling, I. 1991. Status report on the polar bear Ursus maritimus. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 21 pp.

Stirling, I. and A. Derocher. 1993. Possible impacts of climatic warming on polar bears. Arctic 46:240-245.

Stirling, I. 1998. Polar Bears. University of Michigan Press, Ann Arbor, Michigan, USA. 220 pp.

U.S. Fish and Wildlife Service. 1994. Conservation plan for the polar bear in Alaska. Unpubl. Rept. Marine Mammals Management, Anchorage, AK. 79 pp.

U.S. Fish and Wildlife Service, Department of the Interior. 1997. Final Environmental Impact Statement, Development of Proposed Treat U.S./Russia Bilateral Agreement for the Conservation of Polar Bear Populations in the Chukchi/Bering Seas. 62 pp.

U.S. Fish and Wildlife Service. 1995. Habitat conservation strategy for polar bears in Alaska. Marine Mammals Management, Anchorage, AK. 232 pp.

U.S. Fish and Wildlife Service. 1995. Importation of polar bear trophies from Canada; proposed rule on legal and scientific findings to implement section 104(c)(5)(A) of the 1994 amendments to the Marine Mammal Protection Act. July 17, 1995. Federal Register 60(136):36382-36400.

U.S. Fish and Wildlife Service. 1997. Importation of polar bear trophies from Canada under the 1994 amendments to the Marine Mammal Protection Act. February 18, 1997. Federal Register 62(32):7302-7331.

U.S. Fish and Wildlife Service. 2002. Stock assessment for polar bear (Ursus maritimus): Chukchi/Bering Seas stock. Marine Mammal Protection Act Stock Assessment Report. 6 pp. Available online at: http://alaska.fws.gov/fisheries/mmm/stock/finalpbcbseas.pdf

U.S. Fish and Wildlife Service. 2002. Stock assessment for polar bear (Ursus maritimus): Southern Beaufort Sea stock. Marine Mammal Protection Act Stock Assessment Report. 5 pp. Available online at: http://alaska.fws.gov/fisheries/mmm/stock/finalpbbeaufortsea.pdf.

U.S. Fish and Wildlife Service. 2003. Proposed rule to authorize the incidental take of small numbers of polar bear and Pacific walrus during oil and gas activities in the Beaufort Sea and adjacent coastal Alaska. Environmental assessment Department of Interior, U.S. Fish and Wildlife Service, Anchorage, Alaska. 60 pp. Available online at: http://alaska.fws.gov/pdf/itr_fr.pdf.

Walruses

Aguilar A. 1987. Using organochlorine pollutants to discriminate marine mammal populations: A review and critique of methods. *Marine Mammal Science*. 3, 242-262.

Becker P. R., Mackey E. A., Demiralp R., Schantz M. M., Koster B. J., and Wise S. A. (1997) Concentrations of chlorinated hydrocarbons and trace elements in marine mammal tissues archived in the U.S. National Biomonitoring Specimen Bank. *Chemosphere* 34, 2067-2098.

Burn, D.M. 2006. Application of Airborne Thermal Imagery to Surveys of Pacific Walrus. *Wildlife Society Bulletin* 34(1).

Eskimo Walrus Commission (http://www.kawerak.org/servicedivisions/nrd/ewc/index.html).

Fay, F.H. 1982. Ecology and biology of the pacific walrus, *Odobenus rosmarus* divergens (Illiger). U.S. Department of the Interior, Fish and Wildlife Service. Washington, D.C. Number 74. 279 pp.

Fay, F.H., Y.A. Bukhtiyarov, S.W. Stoker and L.M. Shults. 1984. Foods of the Pacific walrus in winter and spring in the Bering Sea. Pp. 81-88 in: Fay, F.H. and G.A. Fedoseev (eds.). Soviet-American cooperative research on marine mammals, vol. I: pinnipeds. NOAA tech. Rep. NMFS-12. U.S. Dept. Commerce, Nat. Marine Fisheries Service, Washington, DC.

Fay, F.H., B.P. Kelly, P.H. Gehnrich, J.L. Sease, and A.A. Hoover. 1984b. Modern populations, migrations, demography, trophics, and historical status of the Pacific walrus in winter and spring in the Bering Sea. Pp. 81-88 In: Fay, F.H. and G.A. Fedoseev (eds.). Soviet-American cooperative research on marine mammals, vol. I: pinnipeds. NOAA tch.rep. NMFS-12 U.S. Dept. Commerce, Nat. Marine Fisheries Service, Washington, DC.

Fay, F.H. 1985. *Odobenus rosmarus*. Mammalian Species No. 238. Amer. Soc. Mamm. 7 pp.

Fay, F.H., B.P. Kelly and J. L. Sease. 1989. Managing the exploitation of Pacific walruses: a tragedy of delayed response and poor communication. Marine Mammal Science 5:1-1

Fay, F.H., L.L. Eberhardt, B.P. Kelly, J.J. Burns, and L.T. Quakenbush. 1997. Status of the Pacific walrus population, 1950-1989. Marine Mammal Science 13:537-565.

Fay, F. H., H. M. Feder, and S. W. Stoker. 1977. An estimate of the impact of the Pacific walrus population on its food resources in the Bering Sea. U.S. Dept. Commer.,

Nat. Tech. Inf. Serv. (Springfield, VA) PB- 273-505. 38pp.

Joling, D., February 25, 2007. "Sea-ice retreat dooms walruses." Anchorage Daily News.

Kaufman, M. April 15, 2006. "Warming Arctic Is Taking a Toll, Peril to Walrus Young Seen as Result of Melting Ice Shelf" Washington Post, p.A7 (http://www.washingtonpost.com/wp-dyn/content/article/2006/04/14/AR2006041401368.html).

Kelly, B.P. 2001. Climate Change and Ice Breeding Pinnipeds. Pp. 43-55 *In* Walther et al. (ed.) "Fingerprints" of Climate Change. Kluwer Academic/Plenum Publishers, New York.

Kucklick, J.R., Krahn, M.M. Becker, P.R. Porter, B.J., Schantz, M.M., York, G.S., O'Hara, T.M., Wise, S.A. 2006. Persistent organic pollutants in Alaskan ringed seal (Phoca hispida) and walrus (Odobenus rosmarus) blubber. J. Environ. Monit., 8, 848-856.

Lowry, L.F. and Hay, F.H. 1984. Seal eating by walrus in the Bering and Chukchi Seas. *Polar Biol.* 3:11-18.

Madin, K. June 6, 2005. "Abandoned Walrus Calves Reported in the Arctic. Melting sea-ice may be forcing mothers to strand their pups in deep water" Oceanus, Woods Hole Oceanic Institution (http://www.whoi.edu/oceanus/viewArticle.do?id=13087).

Marine Mammal Commission. 2004. Annual Report to Congress. 70-71. (www.mmc.gov/reports/annual).

Muir D. C. G., Segstro M. D., Hobson K. A., Ford C. A., Stewart R. E. A., and Olpinski S. 1995. Can seal eating explain elevated levels of PCBs and organochlorine pesticides in walrus blubber from eastern Hudson Bay (Canada)? *Environ. Pollut.* 90, 335-348.

Oliver, J. S., P. N. Slattery, E. F. O'Connor, and L. F. Lowry. 1983. Walrus, Odobenus rosmarus, feeding in the Bering Sea: a benthic perspective. Fish. Bull. 81:501-512.

Pungowiyi, C. "How have changes in Arctic environment over the past 50 years affected the Alaska Native community? Native observations of change in the marine environment of the Bering Strait region." (www.arctic.noaa.gov/essay_pungowiyi.html).

Ray, G. C. 1973. Underwater observation increases understanding of marine mammals.

Mar. Tech. Soc. J. 7:16-20.

Ray, C., McCormick-Ray, J., Berg, P., Epstein, H.E., 2006. Pacific Walrus: Benthic bioturbator of Beringia. Journal of Experimental Marine Biology and Ecology. 403-419.

Reeves, R.R., B.S. Stewart, and S. Leatherwood. 1992. The Sierra Club Handbook of Seals and Sirenians. Sierra Club Books, San Francisco, California. Xvi + 359 pp.

Richard, P.R. 1990. Habitat description and requirements. Pp. 21-26 in: F.H. Fay, B. P. Kelly, and B.A. Fay (eds.) The ecology and management of walrus populations – report of an international workshop. Final report MMC contract T68108850. NTIS PB91-100479. 186 pp.

Richard, P.R., and R.R. Campbell. 1988. Status of the Atlantic walrus, *Odobenus rosmarus rosmarus*, in Canada. Canadian Field-Nat. 102:337-350.

Seal Conservation Society, Walrus (http://www.pinnipeds.org/species/walrus.htm).

Seese, J.L. and D.G. Chapman. 1988. Pacific walrus. Pp. 17-38 in: J.W. Lentfer (ed.) Selected marine mammals of Alaska: species accounts with research and management recommendations. Marine Mammal Commission, Washington, D.C.

Sease, J. L., and F. H. Fay. 1987. The walrus. Pages 357-368 in R. L. DiSilvestro (ed.) Audubon Wildlife Report 1987. National Audubon Soc., New York, NY.

Sheffield, G. 1988. Unpubl. field report. U.S. Fish and Wildlife Service. Togiak National Wildlife Refuge, Dillingham, Alaska.

Taylor, D., S. Schliebe, and H. Metsker. 1989. Contaminants in blubber, liver, and kidney tissue of Pacific walruses. Mar. Pollut. Bull. 20(9):465-468.

U.S. Fish and Wildlife Service. 2002. Stock assessment for Pacific walrus *(Odobenus rosmarus divergens)*, Alaska stock. Marine Mammal Protection Act Stock Assessment Report. 6 pp. Available online at: http://alaska.fws.gov/fisheries/mmm/stock finalpwalrusalaska.pdf.

U.S. Geologic Survey, March 2006. Final Study Plan for Estimating the Size of the Pacific Walrus Population (http://alaska.usgs.gov/science/biology/walrus/pdfs/FinalWalrusStudyPlan.doc).

U.S. Geologic Survey, October 2004. Genetic Studies of the Pacific Walrus (http://alaska.usgs.gov/science/biology/walrus/pdfs/Genetics_Handout.pdf).

U.S. Geologic Survey. "Pacific Walrus Population Estimation" (http://www.absc.usgs.gov/research/biometrics/walrus_population_estimation.htm).

U.S. Geologic Survey, February 2002. Study Plan: Population Genetics of the Pacific Walrus (http://alaska.usgs.gov/science/biology/walrus/pdfs/Genetics_Handout.pdf).

Vibe, C. 1950. The marine mammals and the marine fauna of the Thule District

(Northwest Greenland) with observations on ice conditions in 1939-1941. Medd. om

Gro/nl. 150:1-117.

Bowhead whales

Abstracts from Spring 2000 Whaling Workshop - Anchorage, AK. (www.uark.edu/misc/jcdixon/Historic_Whaling/Workshop/Workshop_Main.htm).

Acoustic Census of Migrating Bowhead Whales. Cornell Lab of Ornithology Bioacoustics Research Program (www.birds.cornell.edu/brp/BowheadCensus.html).

Ahmaogak, Maggie, Alaska Eskimo Whaling Commission Executive Director's comments to participants in AEWC/ENRI/NSF project – "Overview and current concerns" (www.uark.edu/misc/jcdixon/Historic_Whaling/AEWC/aewc_maggie%20presentation.htm#_ftnref4)

Alaska Annual Studies Plan Final FY 2007. Minerals Management Service Alaska OCS Region. September 2006. 176 p.

Alaska Eskimo Whaling Commission Management Plan, As Amended February 15, 1995. (http://www.uark.edu/misc/jcdixon/Historic_Whaling/AEWC/manplan_final.pdf).

Alaska Eskimo Whaling Commission. Restated Bylaws of the Alaska Eskimo Whaling Commission, March 13, 1998. (www.uark.edu/misc/jcdixon/Historic_Whaling/AEWC/bylaws_final.pdf).

American Cetacean Society Factsheet Bowhead Whales (www.acsonline.org/factpack/bowhead.htm).

Angliss, R.P. and R.B. Outlaw. Bowhead Whale Western Arctic Stock. Alaska Marine Mammal Stock Assessments, 2005. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-AFSC-161, pp. 194-199 (www.nmfs.noaa.gov/pr/pdfs/sars/ak2005.pdf).

Blackwell, S.B. and C.R. Greene, Sounds from an oil production island in the Beaufort Sea in summer: Characteristics and contribution of vessels. J. Acoust. Soc. Am. 119. January 2006 pp. 182-196.

Bauman, Margaret, "Concern raised over effects of seismic exploration Industry representatives say protections in place for whales in Chukchi Sea are adequate" Alaska Journal of Commerce. August 18th, 2006.

"Bowhead Biology and Management." North Slope Borough Department of Wildlife Management (www.oark.edu/misc/jcdixon/Historic_Whaling/Whale_biology/bowhead_behavior&bio.htm_).

Cooperative Agreement between NOAA and AEWC as amended 2003 (effective 1998-2008) (www.fakr.noaa.gov/protectedresources/whales/bowhead/aewc2003agreement.pdf).

Dehn, L.A., Follman, E.H., Rosa, C., Duffy, L.K., Thomas, D.L., Bratton, G.R., Taylor, R.J., O'Hara, T.M., 2006. Stable isotope and trace element status of subsistence-hunted bowhead and beluga whales in Alaska and gray whales in Chukotka. Marine Pollution Bulletin, 52, 301-319.

Department of Wildlife Management, North Slope Borough (www.north-slope.org/departments/wildlife/).

Journal of Cetacean Research and Management, International Whaling Commission. Editorial Summarizing the 2005 Scientific Committee Meeting, Assessment of Stocks subject to Aboriginal Subsistence Whaling. (http://www.iwcoffice.org/publications/editorialnew.htm#stocks).

Hoekstra, P.F., Wong, C.S., O'Hara, T.M., Solomon, K.R., Mabury, S.A., Muir, D.C., 2002. Enantiomer-Specific Accumulation of PCB Atropisomers in the Bowhead Whale (Balaena mysticetus). Environ. Sci. Techol. 36, 1419-1425.

Hoekstra P. F., O'Hara, T. M., Pallant, S. J., Solomon, K. R., Muir D. C., 2002. Bioaccumulation of Organochlorine Contaminants in Bowhead Whales *(Balaena mysticetus)* from Barrow, Alaska. Arch. Environ. Contam. Toxicol. 42, 497-507.

International Whaling Commission (www.iwcoffice.org/).

"Listing of Bowhead Whale Related Documents Resulting from Research Conducted and/or Supported by the North Slope Borough Department of Wildlife Management (1981-2001)" (www.north-slope.org/nsb/Listing%20of%20Bowhead%20Documents.doc).

Marquette, W.M., Annotated Bibliography of the Bowhead Whale, *Balaena mysticetus*, 1767-1983. NMFS NOAA Technical Memorandum NMFS-AFSC-127 (http://nmml.afsc.noaa.gov/CetaceanAssessment/bowhead/BowheadBib3.htm).

Minerals Management Service Alaska OCS Region, Final Programmatic Environmental Assessment Arctic Ocean Outer Continental Shelf Seismic Surveys – 2006.

Notice of the aboriginal subsistence whaling quota for bowhead whales. U.S. Federal Register. 71 FR 7539. February 13, 2006 (www.fakr.noaa.gov/notice/71fr7539.pdf).

Richardson, W.J., T.L. McDonald, C.R. Greene, and S.B. Blackwell. 2004. Acoustic localization of bowhead whales near Northstar, 2001-2003: Evidence of deflection at high-noise times. Chapter 8 *In* W.J. Richardson and M.T. Williams (eds.). 2004. Monitoring of industrial sounds, seals, and bowhead whales near BP's Northstar oil development, Alaskan Beaufort Sea, 1999-2003.

Rosa, Cheryl, DVM, University of Alaska Fairbanks, Institute of Arctic Biology and Department of Biology and Wildlife "Bowhead Whale Health Assessment" (www.alaska.edu/inbre/inbregradfellows.html#Rosa).

Sheldon Kim E. W. and David J. Rugh, "The Bowhead Whale, Balena mysticetus: Its Historic and Current Status," National Marine Mammal Laboratory, (http://nmml.afsc.noaa.gov/CetaceanAssessment/bowhead/bmsos.htm).

Woshner, V.M., O'Hara, T.M., Eurell, J., Wallig, M.A., Bratton, G.R., Suydam, R.S., Beasley, V.R., 2002. Distribution of Inorganic Mercury in Liver and Kidney of Beluga and Bowhead Whales Through Autometallographic Development of Light Microscopic Tissue Sections. Toxicologic Pathology, vol. 30, no. 2, pp 209-215.

IFAW
www.ifaw.org

Asia Pacific

Canada

China

East Africa

European Union

France

Germany

Japan

Latin America

Middle East

Netherlands

Russia

Southern Africa

United Kingdom

United States

Recycled

Congress of the United States
Washington, DC 20515

June 15, 2006

Dr. Scott Schliebe
Supervisor
U.S. Fish and Wildlife Service
Marine Mammals Management Office
1011 East Tudor Road
Anchorage, Alaska 99503

Re: Comments on Polar Bear 90-day Petition Finding and Initiation of Status Review

Dear Dr. Schliebe:

Since the initial filing to list the polar bear as a threatened species under the Endangered Species Act (ESA) on February 2, 2005, additional scientific evidence and commercial data warrants your attention as the U.S. Fish and Wildlife Service (FWS) continues to review the status of the polar bear pursuant to section 4 of the Act, 16 U.S.C. § 1533. We urge you to consider the newest research and data concerning dangers to polar bear habitat and health. We also call your attention to the lack of regulatory mechanisms that address the root causes of these dangers. We believe that a review of this evidence strongly favors listing the polar bear as a "threatened" species under the ESA.

The polar bear (*Ursus maritimus*) is the largest of the world's bears. Over the last 100,000 years, the polar bear has evolved into a predator finely adapted to hunting in the Arctic's ice-covered waters. Polar bears are particularly dependant on ringed seals and bearded seals, which they specialize in hunting (Stirling 1998; Derocher, *et al.*, 2004). Ringed seals and bearded seals themselves are ice-dependent species. In addition to locating prey, polar bears also employ sea ice to migrate, to locate mates and, in some cases, as maternity denning habitat. Indeed, the polar bear's dependence on sea ice is so complete that populations are not found where sea ice is not present for a substantial portion of the year (Polar Bear Specialist Group ("PBSG") 2005; Stirling & Derocher 1993). In addition, essential polar bear habitat includes sea ice—particularly areas adjacent to leads and polynyas—and terrestrial maternity denning areas.

Polar bears have a circumpolar distribution and are found throughout the Arctic, including in Russia, Alaska, Canada, Greenland and Norway, including Spitzbergen. Polar bear distribution is not uniform, as polar bears show a strong preference for ice floe edges, fast ice with drifts, and moving ice (Striling 1998; Stirling & Derocher 1993). There currently are 20 recognized populations of polar bears worldwide. In the United States, the FWS has already recognized Important Habitat Areas for the polar bear as part of its polar bear conservation strategy (Fish and Wildlife Service 1995).

PRINTED ON RECYCLED PAPER

As set forth below, the scientific evidence is now clear that the loss of sea ice habitat threatens the world's polar bear populations with extinction. Studies have revealed the lowest summer sea ice extent ever recorded in the Arctic, as well as alarming evidence that winter sea ice recovery rates are declining significantly (eg, Laxon, *et al. 2003).* Other studies have shown that accumulating organochlorines in the polar bear's adipose tissue affect the bear's immune system, hormone regulation, growth patterns, reproduction and survival rates. Finally, current U.S. law does not provide adequate regulatory mechanisms to grapple with the problems confronting the global polar bear populations, whether those problems stem from warming, toxic contamination, or unlawful and illegal harvests.

Various conservation organizations have petitioned the FWS to list the polar bear as a "threatened" species. [*See* Petition to List the Polar Bear as Threatened; Notice of 90-day petition finding and initiation of status review, 71 Fed. Reg. 6745 (Feb. 9, 2006)]. The ESA defines a threatened species as one that is likely to become an endangered species within the foreseeable future [16 U.S.C. § 1532(20)]. FWS must base its listing decision *solely* on the basis of the "best scientific and commercial data available" [16 U.S.C. § 1533(b)(1)(A)]. A species may be listed because of any combination of the following factors: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial or recreational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors [16 U.S.C. § 1533(a)(1)].

In the case of the polar bear, multiple factors support listing.

Most importantly, polar bear sea ice habitat is threatened with destruction, modification, and curtailment due to global warming. There is consensus within the scientific community that increasing concentrations of carbon dioxide and other "greenhouse" gases in the atmosphere are causing global average temperatures to increase. Indeed, the ten warmest years on record all have occurred since 1990 and early this year, National Aeronautics and Space Administration confirmed that 2005 was tied with 1998 for the hottest year on record (Hansen, *et al.* 2006). Nowhere is this trend more pronounced than in the Arctic. The National Snow and Ice Data Center reported a new record minimum for Arctic sea ice extent in September 2005 (NSIDC, 2005) and the loss of mass of the Greenland ice sheet has doubled since 1996 (Rignot & Kanagaratnam 2006). Most recently, the Center released data showing significant continued declines in winter sea ice extent—the lowest Arctic winter sea ice extent since the beginning of the satellite record in 1979 (NSIDC, 2006). Many climate models now predict a 10 to 50 percent decrease in annual average sea ice extent by 2100 and some models show a complete disappearance of summer sea ice extent in as little as 40 years. Polar bears simply cannot survive such a dramatic reduction—or complete elimination—of their habitat.

Additionally, from their perch at the top of the Arctic food chain, toxic contaminants concentrated in arctic wildlife and prey rapidly accumulate in the polar bear's adipose tissue. Thus, polar bear populations also continue to be stressed by toxic pollution, including chlorinated hydrocarbon contaminants (CHCs), perfluorochemicals, mercury, and organochlorines. Most recently, researchers concluded that organochlorines impair the polar bear's immune system and already could be having population-level impacts on polar bears in Canada and Norway (Fisk *et al.* 2005). Another study on polar bears in eastern Greenland has correlated liver inflammation with long-term exposure to organohalogens, such as polybrominated diphenyl ethers (PBDEs) (Somme, *et al.* 2005). Further, a recent look at the combination of the affects of toxic contaminants and climate change may be a worst-case scenario for Arctic mammals and seabirds (Jenssen, 2006).

Finally, although polar bear hunting is responsibly managed in the United States and Norway, polar bear populations in other countries continue to suffer from likely overharvest, particularly in Canada and Greenland, or poaching, such as in Russia (Lunn, *et al.* 2002; Angliss & Lodge 2004).

Even more troubling is the near complete absence of regulatory mechanisms in the United States that could help address the threat of global warming to polar bear habitat. There also is a need for the U.S. House of Representatives to consider legislation, recently passed by the U.S. Senate, to enable and implement the agreement between the Government of the United States of America and the Government of the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population, which was signed at Washington, D.C., on October 16, 2000.

Listing the polar bear under the ESA would provide clear benefits to the species, including protection of its essential habitat and the mandatory preparation of a polar bear recovery plan. The ESA is one of the United States' most successful environmental laws. More than 98 percent of the species listed under the ESA still are alive today due in no small part to its protections.

Thank you for providing us with the opportunity to comment on the status of the polar bear. We argue that there is ever-increasing evidence that the continued existence of the polar bear is threatened. We strongly urge you in this review to adhere to the ESA's mandate to consider *solely* the best available scientific evidence and not to allow politics to enter this process. We appreciate your serious attention to this important matter.

Sincerely,

Wayne T. Gilchrest

JAY INSLEE
Member of Congress

WAYNE GILCHREST
Member of Congress

Nick Rahall
NICK J. RAHALL
Member of Congress

Curt Weldon
CURT WELDON
Member of Congress

George Miller
GEORGE MILLER
Member of Congress

CHRISTOPHER SHAYS
Member of Congress

Frank Pallone Jr.
FRANK PALLONE Jr.
Member of Congress

Mike Fitzpatrick
MICHAEL FITZPATRICK
Member of Congress

Edward J. Markey
ED MARKEY
Member of Congress

Lois Capps
LOIS CAPPS
Member of Congress

Grace F. Napolitano
GRACE NAPOLITANO
Member of Congress

Rosa L. DeLauro
ROSA DELAURO
Member of Congress

Raúl M. Grijalva
RAÚL GRIJALVA
Member of Congress

Steven Rothman
STEVE ROTHMAN
Member of Congress

Dale E Kildee
DALE KILDEE
Member of Congress

Barbara Lee
BARBARA LEE
Member of Congress

Earl Blumenauer
EARL BLUMENAUER
Member of Congress

Julia Carson
JULIA CARSON
Member of Congress

Danny K. Davis
DANNY K. DAVIS
Member of Congress

Lloyd Doggett
LLOYD DOGGETT
Member of Congress

Sam Farr
SAM FARR
Member of Congress

Jane Harman
JANE HARMAN
Member of Congress

MAURICE HINCHEY
Member of Congress

EDDIE BERNICE JOHNSON
Member of Congress

Dennis J. Kucinich
DENNIS KUCINICH
Member of Congress

Betty McCollum
BETTY McCOLLUM
Member of Congress

Tom Lantos
TOM LANTOS
Member of Congress

JAMES McGOVERN
Member of Congress

MARTIN MEEHAN
Member of Congress

Donald M Payne
DONALD PAYNE
Member of Congress

ADAM SCHIFF
Member of Congress

Jim McDermott
JIM McDERMOTT
Member of Congress

Jim Moran
JAMES MORAN
Member of Congress

Jerrold Nadler
JERROLD NADLER
Member of Congress

ROBERT WEXLER
Member of Congress

JAMES LEACH
Member of Congress

cc: The Honorable Dirk Kempthorne
Secretary of Department of the Interior

cc: The Honorable Dale Hall
Director of Fish and Wildlife Services

References

Angliss, R.P. and K.L. Lodge. 2004. *Alaska Marine Mammal Stock Assessement, 2003.* United States Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-144.

ACIA. 2004. *Impacts of a Warming Climate: Arctic Climate Impact Assessment.* Cambridge University Press, available at http://amap.no/acia/.

Derocher, A.E., N.J. Lunn, and I. Stirling. 2004. Polar bears in a warming climate. Integrated Comparative Biology 44:163-176.

Fish & Wildlife Service. 1995. *Habitat Conservation Strategy for Polar Bears in Alaska.* Marine Mammals Management, Anchorage, AK. 232.

Fisk, A.T. C.A. de Wit, M. Wayland, Z.Z. Kuzyk, N. Burgess, R. Letcher, B. Braune, R. Norstrom, S.P. Blum, C. Sandau, E. Lie, H.J.S. Larsen, J.U. Skaare and D.C.G. Muir. 2005. Assessment of the toxicological significance of anthropogenic contaminants in Canadian arctic wildlife, *Science of the Total Environment*, 351-352, 57-93.

Hansen, J., R. Ruedy, M. Sato and K. Lo. 2006. GISS Surface Temperature Analysis, Global Temperature Trends: 2005 Summation, NASA's Goddard Institute for Space Studies, available at: http://data.giss.nasa.gov/gistemp/2005/.

Jenssen, B.M. 2006. Endocrine-Disrupting Chemicals and Climate Change: A Worst-Case Combination for Arctic Marine Mammals and Seabirds? *Environ Health Perspect* 114(suppl 1) :76-80, available at: http://www.ehponline.org/members/2005/8057/8057.html#conc.

Laxon, S., N. Peacock, and D. Smith. 2003. High Interannual Variability of Sea Ice Thickness in the Arctic Region, *Nature*, 44, 947-950.

Lunn, N.J., Schliebe, S. & Born, E.W. (comps. and eds.). 2002. *Polar Bears: Proceedings of the 13th Working Meeting of the IUCN/SSC Polar Bear Specialists Group, Nuuk, Greenland*, IUCN, available at http://pbsg.npolar.no/.

National Snow and Ice Data Center. 2005. Sea Ice Decline Intensifies, available at: http://nsidc.org/news/press/20050928_trendscontinue.html.

National Snow and Ice Data Center. 2006. Winter Sea Ice Fails to Recover, Down to Record Low, available at: http://nsidc.org/news/press/20060404_winterrecovery.html.

Polar Bear Specialist Group ("PBSG"). 2005. Threats to Polar Bears, available at: http://pbsg.npolar.no/.

Rignot, E. and P. Kanagaratnam. 2006. Changes in the Velocity Structure of the Greenland Ice Sheet, *Science*, 311, 986 – 990.

Somme, C., R. Dietz, P.S. Leifsson, E.W. Born, R.J. Letcher, M. Kirkegaard, D.C.G. Muir, F.F. Riget and L. Hyldsrup. 2005. Do organohalogen contaminants contribute to histopathology in liver from East Greenland polar bears (*Ursus maritimus*)? *Environmental Health Perspectives*, 113, 1569-1574.

Stirling, I. 1998. Polar Bears. University of Michigan Press, Ann Arbor, Michigan, USA, 220.

Stirling, I. and A.E. Derocher. 1993. Possible impacts of climatic warming on polar bears. Arctic 46(3), 240-245.

Congreſs of the United States
Houſe of Repreſentatives
Waſhington, DC 20515

February 16, 2007

Dr. Scott Schliebe
Supervisor
U.S. Fish and Wildlife Service
Marine Mammals Management Office
1011 East Tudor Road
Anchorage, Alaska 99503

Re: Request for Hearings on listing the polar bear as threatened under the Endangered Species Act (ESA)

Dear Dr. Schliebe:

We support the Department of the Interior's proposal to list the polar bear as threatened under the Endangered Species Act (ESA) and appreciate your efforts to protect this important species and its habitat. As this process moves forward, we request that U.S. Fish and Wildlife Service (FWS) help our constituents participate by making a series of public hearings accessible to Americans throughout the United States.

The polar bear has become an icon, capturing the hearts of children and Americans, who have made a pastime of visiting these marine mammals in zoos around the country. While the Arctic Circle may be distant from the lower 48 states and Hawaii, threats to the polar bear, including global warming and toxic pollutants, impact all Americans. Additionally, our states are home to important research institutions and universities. The opportunity to contribute data and comments in person at FWS public hearings on this important topic is of great significance for Americans in our districts.

Thank you for your attention to our concerns. We look forward to working with you regarding opportunities for our constituents to attend public hearings on the polar bear as FWS continues work in the ESA listing process.

Sincerely,

Jay Inslee
JAY INSLEE (WA-01)
Member of Congress

Nick Rahall
NICK J. RAHALL (WV-03)
Member of Congress

Raúl M. Grijalva
RAÚL GRIJALVA (AZ-07)
Member of Congress

CHRISTOPHER SHAYS (CT-04)
Member of Congress

HENRY WAXMAN (CA-30)
Member of Congress

Donna M. Christensen
DONNA CHRISTENSEN (V.I.)
Member of Congress

George Miller
GEORGE MILLER (CA-07)
Member of Congress

Dale E. Kildee
DALE KILDEE (MI-05)
Member of Congress

Barbara Lee
BARBARA LEE (CA-09)
Member of Congress

Rosa L. DeLauro
ROSA DELAURO (CT-03)
Member of Congress

Frank Pallone Jr.
FRANK PALLONE Jr. (NJ-06)
Member of Congress

Earl Blumenauer
EARL BLUMENAUER (OR-03)
Member of Congress

Julia Carson
JULIA CARSON (IN-07)
Member of Congress

Lloyd Doggett
LLOYD DOGGETT (TX-25)
Member of Congress

Dennis J Kucinich
DENNIS KUCINICH (OH-10)
Member of Congress

MAURICE HINCHEY (NY-22)
Member of Congress

Sam Farr
SAM FARR (CA-17)
Member of Congress

Betty McCollum
BETTY McCOLLUM (MN-04)
Member of Congress

Tom Lantos
TOM LANTOS (CA-12)
Member of Congress

Jim McDermott
JIM McDERMOTT (WA-07)
Member of Congress

Jim McGovern
JAMES McGOVERN(MA-03)
Member of Congress

Jim Moran
JAMES MORAN (VA-08)
Member of Congress

Jerrold Nadler
JERROLD NADLER (NY-08)
Member of Congress

Donald M Payne
DONALD PAYNE (NJ-10)
Member of Congress

ADAM SCHIFF (CA-29)
Member of Congress

Tom Allen
TOM ALLEN (ME-01)
Member of Congress

Rush Holt
RUSH HOLT (NJ-12)
Member of Congress

Tammy Baldwin
TAMMY BALDWIN (WI-02)
Member of Congress

Ron Kind
RON KIND (WI-03)
Member of Congress

Peter DeFazio
PETER DEFAZIO (OR-04)
Member of Congress

Lois Capps
LOIS CAPPS (CA-23)
Member of Congress

Ed Markey
EDWARD MARKEY (MA-07)
Member of Congress

G.K. BUTTERFIELD (NC-01)
Member of Congress

ROBERT WEXLER (FL-19)
Member of Congress

Jan Schakowsky
JAN SCHAKOWSKY (IL-09)
Member of Congress

MARTY MEEHAN (MA-05)
Member of Congress

MIKE DOYLE (PA-14)
Member of Congress

Baron P. Hill
BARON HILL (IN-09)
Member of Congress

MARK UDALL (CO-02)
Member of Congress

Congress of the United States
House of Representatives
Washington, DC 20515

April 9, 2007

Ms. Rosa Meehan
Supervisor
U.S. Fish and Wildlife Service
Polar Bear Project Leader
Marine Mammals Management Office
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

RE: Comments on the Proposal to List the Polar Bear as a Threatened Species (72 Fed. Reg. 1064-1099)

Dear Ms. Meehan:

We write in support of the Proposal to List the Polar Bear as a Threatened Species under the Endangered Species Act (ESA). The scientific evidence overwhelmingly supports listing the polar bear under ESA to prevent its further endangerment and possible extinction. The predominant threat to the polar bear is the significant loss of essential Arctic sea ice habitat it needs to survive. This marked decline in sea ice habitat is directly linked to effects of global climate change. We urge the Fish and Wildlife Service (FWS) to adopt a final rule to extend ESA protections to the polar bear based on this factor.

We appreciate the thoroughness with which FWS has examined scientific information about the polar bear and its vanishing habitat in the proposed rule. Under ESA, FWS must base listing decisions solely on the basis of the "best scientific and commercial data available" [16 U.S.C. § 1533(b)(1)(A)]. The best available polar bear science signals the clear duty to list the polar bear.

Under ESA, a species may be listed based on one or more of the following factors: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial or recreational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors [16 U.S.C. § 1533(a)(1)].

The polar bear merits listing based on multiple factors. Primary among these are the observed and predicted destruction, modification, and curtailment of its sea ice habitat due to global warming. There is broad scientific consensus that rising concentrations of carbon dioxide and other greenhouse gases in the atmosphere are causing global average temperatures to increase, particularly in high latitude regions. In the Arctic, rising temperatures have already resulted in decreasing sea ice extent, with 2005 setting the record for the lowest recorded summer sea ice extent.[1] Most recently, leading scientists projected that the Arctic may be completely free of sea-ice in the summer as early as 2040.[2] Polar bears rely entirely on the sea ice for hunting, breeding and rearing their young. Without sea ice, they will be unable to survive.

In addition, as the Arctic's top predator, polar bears are threatened by the buildup of toxic contaminants such as chlorinated hydrocarbon contaminants (CHCs), perfluorochemicals, mercury, and organochlorines in their bodies.[3] Finally, although polar bear hunting is managed responsibly in the United States and Norway, overharvest remains a potential threat to polar bear populations in other countries.[4]

There is scientific consensus that global warming is happening—the recently released Arctic Survey Report and Intergovernmental Panel on Climate Change reports show that global warming is happening and human activities are contributing to it.[5] As such, while we applaud the proposal overall, we urge the service to improve the final rule by including a discussion, omitted from the proposed rule, of the adequacy or inadequacy of existing regulatory mechanisms to address global warming. We are aware such a discussion was contained in the FWS status review that provided analyses of the effect of greenhouse-gas pollution on global warming and the retreat of sea ice, and the lack of existing mechanisms to regulate climate change and reduce the loss of sea ice.[6]

We understand that the congressional intent of the ESA was to identify threats to species and then eliminate or ameliorate those factors. Therefore, we believe that when FWS lists the polar bear, the final rule should address the adequacy of existing regulatory mechanisms of anthropogenic greenhouse gas emissions, the primary threat to the polar bear, with the same level of detail that the proposed rule addressed the retreat of the sea ice and other ecological changes in the Arctic. Further, we urge FWS to publish a meaningful recovery plan within 12 months of the rule. Because FWS' proposed rule identified melting sea ice as the primary threat to the polar bear, any recovery plan should include specific corrective actions to address that threat, which likely would necessitate reductions of greenhouse gases.

---

[1] National Snow and Ice Data Center. Sea Ice Decline Intensifies, available at: http://nsidc.org/news/press/20050928_trendscontinue.html. September 2005.

[2] Holland, Marika M., Cecilia M. Bitz, and Bruno Tremblay. 2006. Future Abrupt Reductions in the Summer Arctic Sea Ice. Geophysical Research Letters, December 12, 2006.

[3] Schliebe, S. et al. 2006. Range-wide Status review of the Polar Bear (Ursus maritimus). U.S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, Alaska. 152-170.

[4] *Ibid.*, 126-127.

[5] Alley, Richard et al. 2007. *Climate Change 2007: The Physical Science Basis (Summary for Policymakers).* IPCC Secretariat, c/o WMO, 7bis, Avenue de la Paix, C.P. N° 2300, 1211 Geneva 2, Switzerland. Available at http://www.ipcc.ch.

[6] Schliebe, S. et al. 2006. Range-wide Status review of the Polar Bear (Ursus maritimus). U.S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, Alaska.

In conclusion, we support the proposed rule to list the polar bear as threatened under ESA and hope that you will seriously consider incorporating our suggestions to improve the final rule and protect the polar bear for generations to come. Thank you for the opportunity to comment on this important matter.

Sincerely,

JAY INSLEE
Member of Congress

CHRISTOPHER SHAYS
Member of Congress

Maurice Hinchey
MAURICE HINCHEY
Member of Congress

Frank A. LoBiondo
FRANK LOBIONDO
Member of Congress

Raúl M. Grijalva
RAÚL GRIJALVA
Member of Congress

George Miller
GEORGE MILLER
Member of Congress

Frank Pallone, Jr.
FRANK PALLONE Jr.
Member of Congress

Tom Lantos
TOM LANTOS
Member of Congress

PETER DEFAZIO
Member of Congress

DONNA CHRISTENSEN
Member of Congress

Mark Udall
MARK UDALL
Member of Congress

Rosa L. DeLauro
ROSA DELAURO
Member of Congress

JAN SCHAKOWSKY
Member of Congress

STEVE ROTHMAN
Member of Congress

EARL BLUMENAUER
Member of Congress

Baron P. Hill
BARON HILL
Member of Congress

Lloyd Doggett
LLOYD DOGGETT
Member of Congress

Betty McCollum
BETTY McCOLLUM
Member of Congress

JIM McDERMOTT
Member of Congress

Jim McGovern
JAMES McGOVERN
Member of Congress

MARTIN MEEHAN
Member of Congress

Donald M. Payne
DONALD PAYNE
Member of Congress

Jim Moran
JAMES MORAN
Member of Congress

ROBERT WEXLER
Member of Congress

Jerrold Nadler
JERROLD NADLER
Member of Congress

Betty Sutton
BETTY SUTTON
Member of Congress

Tammy Baldwin
TAMMY BALDWIN
Member of Congress

Albert R. Wynn
ALBERT WYNN
Member of Congress

CHARLES GONZALEZ
Member of Congress

José E. Serrano
JOSE SERRANO
Member of Congress

Barbara Lee
BARBARA LEE
Member of Congress

Carolyn B. Maloney
CAROLYN MALONEY
Member of Congress

TOM ALLEN
Member of Congress

STEPHEN LYNCH
Member of Congress

CHRIS VAN HOLLEN
Member of Congress

RON KIND
Member of Congress

Lois Capps
LOIS CAPPS
Member of Congress

G.K. BUTTERFIELD
Member of Congress

MICHAEL DOYLE
Member of Congress

Ed Markey
EDWARD MARKEY
Member of Congress

JULIA CARSON
Member of Congress

cc: The Honorable Dirk Kempthorne
Secretary of Department of the Interior

cc: The Honorable Dale Hall
Director of Fish and Wildlife Service

cc: The Honorable John F. Kerry
United States Senate

Congreſs of the United States
House of Representatives
Washington, DC 20515

June 29, 2007

The Honorable Dirk Kempthorne
U.S. Department of the Interior
1849 C Street, NW
Washington, DC 20240

Dear Secretary Kempthorne:

We are writing to ask you to postpone a decision on offshore oil and gas lease sales in critically important Alaskan ecosystems; specifically in Bristol Bay and the Chukchi and Beaufort Seas. These areas provide essential habitat for threatened and endangered species as well as support the livelihoods of thousands of people throughout the state and the nation including local communities who depend on subsistence fishing, hunting and whaling. The Proposed Final 5-Year Outer Continental Shelf Oil and Gas Leasing Program for 2007-2012 threatens the ecologic and socioeconomic stability of Alaska's sensitive environment. And as long as the Administration continues to pursue the current energy policy of drilling our way to independence, we fail to address the real consequences of significant climactic change.

Bristol Bay is the ecological engine for a $2 billion commercial fishing industry. It is the world's largest wild sockeye salmon run as well as a vital fishery for halibut, red king crab, pollock and other species. Bristol Bay also supports designated critical habitat for the endangered North Pacific right whale and is home to 25 species of marine mammals. The Chukchi and Beaufort Seas, America's "Polar Bear Seas," provide essential habitat for one-fifth to one-sixth of the world's remaining wild polar bears. The Department's recent proposal to list the polar bear as threatened under the Endangered Species Act generated responses from over a half-million Americans, demonstrating the charisma and popularity of the species.

We are concerned about the vulnerability of these areas to petroleum development. The House Committee on Appropriations stated in the FY08 Interior bill that, "given the extreme oceanographic and meteorological conditions prevalent in the North Aleutian Basin and the extremely valuable fishery, it is vital that outer continental shelf oil or gas drilling only be conducted after detailed studies and information are available and guarantee safety. The Committee is very concerned that there is a lack of sound, peer-reviewed scientific data to support OCS leasing decisions in this area." The lack of scientific knowledge necessitates the postponement of decisions regarding offshore lease sales until the following occur:

1. **Scientific information must be gathered about the ecosystems and wildlife of Bristol Bay and the Chukchi and Beaufort Seas in order to better understand the**

impacts oil and gas exploration and production may have on the regions. Proceeding without this set of information will endanger the survival of the already imperiled wildlife and consequently threaten the productivity of fishing and other renewable resource industries upon which the local people and many other Americans depend.

2. **Before initiating offshore oil and gas development clean-up technologies must be developed that could adequately address the impacts of oil spills in these unique areas.** MMS has stated that oil spills are likely results of the new plan; however, they have not proposed effective mitigation techniques. No further energy development should occur in these areas until proven oil spill cleanup methods that address the complicated challenges of Alaskan weather and sea conditions have been established.

3. **A comprehensive evaluation must be conducted of cumulative impacts on whales and other marine mammals from exposure to oil and gas development activities.** Insufficient information is available to address the impacts of increased noise and activity over an extended period of time on the wildlife in the proposed areas. Sparse, minor disturbances may have little impact; however, extended exposure could have devastating consequences for the resident wildlife. These impacts need to be understood and addressed before energy development progresses.

Pursuing an energy development plan that fails to address all of the pertinent effects it will have on wildlife, local communities, industries and the resource-based economy is unwise. Global warming is already negatively impacting the proposed lease sale areas; exacerbating these impacts through increased noise, oil spills and interrupted behavioral patterns may cause the decline of wildlife populations and the collapse of valuable fishing and hunting industries and subsistence practices. The sustained annual value of these activities is far greater than the finite benefits of prospective oil and gas reserves. We implore you to protect the integrity and functionality of millions of acres of pristine lands and waters by postponing decisions on offshore lease sales until all of these critically important concerns have been resolved.

Sincerely,

Tammy Baldwin

Jim Moran

Robert Wexler

Henry A. Waxman

Barney Frank

Howard L. Berman

Earl Blumenauer

Carolyn B. Maloney

Luis V. Gutierrez

Dale E. Kildee

Donald M. Payne

Jim McDermott

Keith Ellison

Tom Allen

John W. Olver

Loretta Sanchez

Frank Pallone Jr.

Pete Stark

Lois Capps

Edward J. Markey

Lynn Woolsey Jay McKay

Congress of the United States
Washington, DC 20515

October 22, 2007

Ms. Rosa Meehan
Supervisor
U.S. Fish and Wildlife Service
Polar Bear Project Leader
Marine Mammals Management Office
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

RE: Comments on the Proposal to List the Polar Bear as a Threatened Species (72 Fed. Reg. 53749-53751)

Dear Dr. Meehan:

The U.S. Geological Survey (USGS) has generated new scientific models which, under current conditions, suggest an even more precarious future for polar bears since the initial filing to list the polar bear as a threatened species under the Endangered Species Act (ESA) in 2005 and the Fish and Wildlife Service's (FWS) proposal to list the polar bear as threatened in January. The nine reports by scientists at USGS this month show that the polar bear is in danger of extinction in most of its range. We believe that these new findings indicate that the polar bear should be listed as endangered under ESA.

We appreciate that in considering a final rule, the service requested that the USGS investigate a number of scientific questions relating to polar bears and their sea ice habitat. The USGS conducted these investigations using existing and new observational data and scientific models. Based on this substantial and rigorous effort, as documented in the nine new reports, the USGS has significantly advanced the understanding of sea ice loss and its implications for polar bears.

The USGS has concluded that polar bears will almost certainly disappear entirely from Alaska by the middle of this century, and that we will have lost fully two-thirds of the world's polar bears by this time. The good news is that polar bears may survive in the high Canadian archipelago and portions of Northwest Greenland through the end of this century. However, the risk of extinction for these polar bear populations by the end of the century is still unacceptably high: over 40 percent in the archipelago over 70 percent in Northwest Greenland, under sea ice conditions forecast by the climate models used in the study.

Ominously, new observational data from this summer show that the actual decline of Arctic sea ice, on which polar bears depend, is underestimated by all currently available models. This suggests that these are conservative estimates and that Polar Bear habitat will likely decline even more quickly than the models project.

PRINTED ON RECYCLED PAPER

The ESA defines an endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range" and a threatened species as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under the current circumstances, we believe the polar bear simply must be listed as endangered rangewide.

While the conclusions of the USGS reports are cause for immediate concern and actions to protect polar bears, they are not cause for despair. The USGS study focused on the A1B "business as usual" Intergovernmental Panel on Climate Change ("IPCC") scenario of future emissions, in which atmospheric carbon dioxide concentrations are assumed to reach 717 parts per million by 2100. The study did not consider a scenario in which greenhouse gas emissions are capped at a much lower level. Stated simply, "business as usual" emissions will drive polar bears to extinction with near certainty, but it is not too late to preserve them if we act now.

Given the perilous status of polar bears in Alaska, we also must maximize the protection of their habitat. We are concerned that the Department of the Interior is moving forward with five lease sales in the Beaufort and Chukchi Seas, in polar bear habitat, through its Outer Continental Shelf (OCS) Oil and Gas Drilling Program for 2007-2012. We believe that any further commitments to fossil fuel development in polar bear habitat should be put on hold until the Fish and Wildlife Service has issued a final listing determination for the polar bear under the ESA.

Thank you for providing us with the opportunity to comment on the new data. As you know, the best available science on polar bears and their sea-ice habitat has improved since the initial petition was filed two years ago and there is ever-increasing evidence that the continued existence of the polar bear is endangered. We strongly urge you in this ruling to continue to adhere to the ESA's mandate to consider *solely* the best available scientific evidence and not to allow politics to enter this process. We appreciate your serious attention to this important matter.

Sincerely,

JAY INSLEE Member of Congress	CHRISTOPHER SHAYS Member of Congress

Edward J. Markey
EDWARD MARKEY
Member of Congress

FRANK LOBIONDO
Member of Congress

MAURICE HINCHEY
Member of Congress

George Miller
GEORGE MILLER
Member of Congress

Raul M. Grijalva
RAUL GRIJALVA
Member of Congress

Jerrold Nadler
JERROLD NADLER
Member of Congress

PETER DEFAZIO
Member of Congress

Earl Blumenauer
EARL BLUMENAUER
Member of Congress

JAN SCHAKOWSKY
Member of Congress

Rosa L. DeLauro
ROSA DELAURO
Member of Congress

Tammy Baldwin
TAMMY BALDWIN
Member of Congress

Albert R Wynn
ALBERT WYNN
Member of Congress

Barbara Lee
BARBARA LEE
Member of Congress

EMANUEL CLEAVER
Member of Congress

Betty McCollum
BETTY McCOLLUM
Member of Congress

Barney Frank
BARNEY FRANK
Member of Congress

Jim McDermott
JIM McDERMOTT
Member of Congress

Chris Van Hollen
CHRIS VAN HOLLEN
Member of Congress

Donald M Payne
DONALD PAYNE
Member of Congress

DENNIS MOORE
Member of Congress

Jim Moran
JAMES MORAN
Member of Congress

ROBERT WEXLER
Member of Congress

ALCEE L. HASTINGS
Member of Congress

HENRY WAXMAN
Member of Congress

José E. Serrano
JOSE SERRANO
Member of Congress

Howard L. Berman
HOWARD L. BERMAN
Member of Congress

John F. Tierney
JOHN TIERNEY
Member of Congress

Luis V. Gutierrez
LUIS V. GUTIERREZ
Member of Congress

Baron P. Hill
BARON HILL
Member of Congress

Jim McGovern
JAMES McGOVERN
Member of Congress

Tom Allen
TOM ALLEN
Member of Congress

Bob Filner
BOB FILNER
Member of Congress

Charles A. Gonzalez
CHARLES A. GONZALEZ
Member of Congress

Dennis J Kucinich
DENNIS KUCINICH
Member of Congress

William D. Delahunt
WILLIAM DELAHUNT
Member of Congress

Hodes
PAUL HODES
Member of Congress

Mike Doyle
MICHAEL DOYLE
Member of Congress

Frank Pallone Jr.
FRANK PALLONE Jr
Member of Congress

Julia Carson
JULIA CARSON
Member of Congress

Lois Capps
LOIS CAPPS
Member of Congress

PATRICK MURPHY
Member of Congress

Michael M Honda
MICHAEL HONDA
Member of Congress

Albio Sires
ALBIO SIRES
Member of Congress

John W Olver
JOHN OLVER
Member of Congress

Sam Farr
SAM FARR
Member of Congress

SANDER M. LEVIN
Member of Congress

Susan Davis
SUSAN DAVIS
Member of Congress

Carolyn B. Maloney
CAROLYN B. MALONEY
Member of Congress

MICHAEL McNULTY
Member of Congress

Carol Shea-Porter
CAROL SHEA-PORTER
Member of Congress

Loretta Sanchez

LORETTA SANCHEZ
Member of Congress

cc: The Honorable Dirk Kempthorne
Secretary of Department of the Interior

cc: The Honorable Dale Hall
Director of Fish and Wildlife Service

Congreſs of the United States
Washington, DC 20515

January 17, 2008

Secretary Dirk Kempthorne
Department of Interior
1849 C Street, NW
Washington, DC 20240

Dear Secretary Kempthorne:

We are deeply troubled over the timing of the U.S. Fish and Wildlife Service's (FWS) delay in announcing its decision on listing the polar bear under the Endangered Species Act (ESA), which was legally required on Jan. 9 2008, concurrent with the Mineral Management Service's (MMS) decision to proceed with Chukchi Sea Oil and Gas Lease Sale 193, which would allow oil and gas leases for almost 30 million acres of the undeveloped Chukchi Sea, an area of essential habitat for approximately one half of the U.S. polar bear population. The science on global warming and the melting of the Arctic is clear; and, the polar bears' dire situation requires immediate action. We implore you to list the polar bear under the Endangered Species Act as endangered and designate critical habitat for the species. Under the law you also should implement and enforce provisions to protect these majestic creatures immediately using "good cause" discretion under federal regulations implementing the ESA.

All the more alarming is the Interior Department's failure to have agencies work collaboratively. We certainly continue to urge FWS' due and timely diligence to review comments on this historical listing decision, but the MMS announcement is yet another example of the Interior Department promoting immense benefits for oil and gas development at the cost of wildlife and ecology. The decision by FWS will help ensure any activities allowed in the regions polar bears inhabit will not jeopardize their survival or damage their habitat. Despite this probable outcome, to proceed now with Chukchi Sea Oil and Gas Lease Sale 193, would disregard important protections for likely endangered species habitat.

As you know, in its Final Environmental Impact Statement on Lease Sale 193 (FEIS) MMS states that: "… our overall finding is that, due the magnitude of potential mortality as a result of a large oil spill, the Proposed Action would likely result in significant impacts to polar bears if a large spill occurred." While polar bear habitat currently is threatened by increasing global temperatures, the damage resulting from increased human activity and oil and gas development may cut off any hope of restoring the polar bear population to a sustainable level.

Furthermore, the threat of an oil spill remains grave- your own department has stated that the risk of a significant oil spill can be as high as 51 percent. Depending on the season, the environment of the Arctic Ocean may also make the cleanup of an oil spill virtually impossible. The MMS also acknowledges that oil and gas development will harass and kill some polar bears.

PRINTED ON RECYCLED PAPER

The wildlife and ecology in this area may never be able to recover from the stresses that oil and gas development will cause.

While the major threat to the survival of polar bears is the retreat of ice in the Arctic Ocean caused by global warming, it makes no sense to place further stress on the species and its habitat by pursuing massive oil and gas development before making a determination on the polar bear's future status under the ESA. We have previously raised this concern with you and the FWS, most recently after the U.S. Geological Survey release a series of reports in September spelling out the extremely dire outlook for polar bears.

For the reasons stated above, we urge you to immediately postpone the planned February 6 Lease Sale 193, add polar bears to the list of endangered species, and designate critical habitat for the species.

As you know, Congress recently passed H.R. 6 into law (Public Law No: 110-140). This law provides the nation with the tools necessary to achieve oil independence and reduce the nation's green-house-gas emissions. Beyond the evidence that this lease sale will negatively affect the habitat of polar bears, the fact remains that we cannot drill our way to oil independence. The actions taken by the FWS and MMS under this administration also will send negative signals to those who are innovating and investing in alternative energy.

Should you decide to go forward with Lease Sale 193 without regard to the concerns we have stated above as well as those of leading scientists in the field, we implore you to provide written justification for ignoring the requirements of the ESA with regard to polar bears prior to any lease sale date. In addition, we reiterate our conclusion that you should postpone any decisions to pursue offshore oil and gas development in the Arctic Ocean and Bearing Sea until such time as the conditions we set out in our letter to you of June 29, 2007 are fully met.

Sincerely,

Maurice Hinchey
Edward J. Markey

JAY INSLEE
Member of Congress

MAURICE HINCHEY
Member of Congress

ED MARKEY
Member of Congress

Lois Capps

CHRIS VAN HOLLEN
Member of Congress

LOIS CAPPS
Member of Congress

FRANK LOBIONDO
Member of Congress

George Miller
GEORGE MILLER
Member of Congress

TOM ALLEN
Member of Congress

EMANUEL CLEAVER
Member of Congress

John W. Olver
JOHN W. OLVER
Member of Congress

Michael M. Honda
MICHAEL M. HONDA
Member of Congress

Barney Frank
BARNEY FRANK
Member of Congress

Anna Eshoo
ANNA ESHOO
Member of Congress

Tammy Baldwin
TAMMY BALDWIN
Member of Congress

Frank Pallone Jr.
FRANK PALLONE
Member of Congress

CHRISTOPHER SHAYS
Member of Congress

Susan Davis
SUSAN DAVIS
Member of Congress

Jim Moran
JIM MORAN
Member of Congress

DENNIS MOORE
Member of Congress

Lynn Woolsey
LYNN WOOLSEY
Member of Congress

Henry A. Waxman
HENRY WAXMAN
Member of Congress

PETER DEFAZIO
Member of Congress

Raúl M. Grijalva
RAUL GRIJALVA
Member of Congress

SANDER M. LEVIN
Member of Congress

Sam Farr
SAM FARR
Member of Congress

Barbara Lee
BARBARA LEE
Member of Congress

Dale E. Kildee
DALE E. KILDEE
Member of Congress

Mike Doyle
MICHAEL DOYLE
Member of Congress

Jim McDermott
JIM MCDERMOTT
Member of Congress

Carol Shea-Porter
CAROL SHEA-PORTER
Member of Congress

Lloyd Doggett
LLYOD DOGGETT
Member of Congress

JERRY MCNERNEY
Member of Congress

Keith Ellison
KEITH ELLISON
Member of Congress

Betty Sutton
BETTY SUTTON
Member of Congress

JAMES P. MCGOVERN
Member of Congress

Pete Stark
PETE STARK
Member of Congress

Donald M Payne
DONALD M. PAYNE
Member of Congress

Earl Blumenauer
EARL BLUMENAUER
Member of Congress

JAN SCHAKOWSKY
Member of Congress

Rosa L. DeLauro
ROSA L. DELAURO
Member of Congress

WWF

World Wildlife Fund
1250 24th Street, NW
Washington, DC 20037-1193 USA
Phone: 202-293-4800
Fax: 202-293-9211
www.worldwildlife.org

January 31, 2008

The Honorable Edward Markey Chair, Select Committee on Energy Independence and Global Warming B243 Longworth House Office Building Washington, DC 20515	The Honorable James Sensenbrenner Ranking Member, Select Committee on Energy Independence and Global Warming H2-344 Ford Building Washington, DC 20515

Dear Chairman Markey and Ranking Member Sensenbrenner:

I am writing to clarify the position of the World Wildlife Fund (WWF) with respect to polar bears and climate change, in response to a potentially misleading comment made by Representative Blackburn of Tennessee during the hearing, "On Thin Ice: The Future of the Polar Bear," held on January 18, 2008 before the Select Committee on Energy Independence and Global Warming.

During the course of the hearing, Representative Blackburn made the comment:

> "And studies done by the World Wildlife Fund, Canadian biologists and American climatologists are in direct contradiction to the claims of some of the scientists. These students [*sic*] found that almost all -- almost all -- of the arctic populations of polar bears are either stable or increasing and that changing wind patterns are the primary causes of changing sea ice distribution, not global warming."

WWF wishes to clarify that WWF strongly supports the listing of the polar bear as threatened under the Endangered Species Act, and believes that the scientific data supporting listing is unequivocal. WWF further does not claim that changing wind patterns are causing changing sea ice distribution.

Margaret Williams, Director of the Kamchatka-Bearing Sea Ecoregion at World Wildlife Fund, described the history behind the decline and subsequent rebound of polar bear populations in testimony before the Senate Environment and Public Works Committee during a hearing on January 30, 2008, entitled, "Examining Threats and Protections for the Polar Bear." She noted that populations of polar bears had declined due to extensive hunting throughout the 20th century, but thanks in part to domestic and international protections, polar bear populations have rebounded over the last 40 years.

In 2001, a WWF report entitled "Polar Bears at Risk" did note that, "Satisfactory monitoring information has been delivered for 14 of the 20 polar bear populations in recent years. Of these, 10 are showing stable population numbers, two seem to be increasing and two are decreasing." However, these figures were referenced in order to highlight that there are several populations that have not been studied and that the populations that are currently stable will be greatly depleted by melting of the sea ice due to global warming.

The same report also states:

> "Temperature changes in the Arctic caused by greenhouse gases emissions have led to reductions in sea ice extent and longer ice-free periods. This trend is expected to continue throughout the 21st century. While the effects of shorter periods of maximum ice extent, as well as changes in sea ice dynamics and structure may vary in different areas of the Arctic, they represent the greatest challenge to conservation of polar bears."

WWF is in full agreement with the latest findings of a report on the state of the polar bear published in 2007 by the U.S. Geological Survey (USGS) that two-thirds of polar bear habitat could be lost by 2050. WWF supports the unequivocal scientific evidence that climate change is causing the disappearance of sea ice from which polar bears hunt their prey.

Enclosed is a copy of the testimony given by Margaret Williams to the Senate Environment and Public Works Committee on January 30, as well as the "Polar Bears at Risk" report, and a fact sheet on polar bear threats and biology.

I would like to request that these materials be included in the official hearing record so that WWF's position is accurately represented.

Please do not hesitate to contact Sybille Klenzendorf, Director of Species Conservation, at 202-778-9723, if you have any questions.

Thank you for this opportunity to clarify our position and for your time.

Sincerely,

Jason Patlis
Vice President and Managing Director
U.S. Government Relations

WWF

Testimony of Margaret Williams
Managing Director
Kamchatka/Bering Sea Ecoregion Program
World Wildlife Fund

before the

Committee on the Environment and Public Works
U.S. Senate

"Examining Threats and Protections for the Polar Bear"

January 30, 2008

Chairwoman Boxer, Ranking Member Inhofe, and Members of the Committee: on behalf of the World Wildlife Fund (WWF), I am pleased to provide you with comments on this very important topic -- the future of polar bears and polar bear habitat, particularly of our polar bear populations here in the United States.

WWF is an international conservation organization with 1.2 million members in the US and over 5 million members worldwide. WWF has been involved in Arctic conservation for over 20 years, and we have offices and field programs in all of the circumpolar Arctic countries.

My own educational and professional background is in conservation biology and policy and for ten years I have been director of WWF's Bering Sea Ecoregion Program, which involves work on both the Alaskan and Russian coasts of this region. In the last several years I have been working closely with Alaska and Russian polar bear biologists and community members to address changes in bear distributions and increasing human-bear interaction, particularly in the Russian Arctic. I am a member of the Council on Foreign Relations and also formerly the chair of WWF's international Arctic team.

Polar bears, the charismatic icon of the polar environment, have long been a focus in WWF's on-the-ground research and conservation projects in the Arctic. Polar bears are an essential part of the Arctic ecosystem: as an apex predator, polar bears also serve as bellweathers for the state of their northern surroundings, an indicator of health for the Arctic.

Polar bears also comprise a central part of Arctic indigenous cultures. For example, Chukchi native people in the Russian Arctic for years practiced ancient rituals and celebrations honoring the polar bear, and today the species remains part of the subsistence cultures of people of Alaska, Greenland and Canada.

Polar bears – and the issue that brings us together today at this hearing -- are also important for their ability to captivate the public's attention. During the public input period for the USFWS' proposed listing of polar bears, hundreds of thousands of comments were generated – a staggering number – indicating the intense interest in the fate of this species.

I. Threats to Polar Bears

Today polar bears face a very serious threat. Analyses recently published by the US Geological Survey show that by mid 21st century, two-thirds of the world's polar bear population could be lost, mainly due to loss of sea ice. As this sea ice habitat decreases, the entire food chain will be affected – from the tiniest plankton to the forage fish, the ringed seal, and the king of the north, the polar bear.

The impacts of global warming on polar bears have been well-documented and are described in World Wildlife Fund's public comments regarding the proposed listing, included as an appendix to this document. In summary, climate change will impact polar bear habitat, polar bear prey, and the reproduction and survival of polar bears. Some of those impacts are as follows:

A. Climate Impacts on Polar Bear Habitat

The most fundamental characteristic of polar bears in relation to their ecology is their utter dependence on sea ice habitats (Derocher et al. 2004). Anything that significantly changes the distribution and abundance, let alone the very existence of sea ice will have profound effects on the persistence of polar bears on Earth. Such habitat loss or fragmentation is well documented to be a primary cause of extinctions (Beissinger 2000, Ceballos and Ehrlich 2002).

Experts agree that the once-characteristic ecotype of the far north is undergoing an unprecedented and accelerating warming trend (ACIA 2004, Serreze et al 2000, Parkinson and Cavalieri 2002, Comiso 2002a, 2002b, 2003), shifting from arctic to subarctic conditions, and in some cases profoundly altering the fundamental biological components that are usually associated with the Arctic realm (e.g. Grebmeier et al. 2006). This consensus confirms what has been known for some time by Native peoples inhabiting this region (e.g. ACIA 2004, WWF *Climate Witness Program* testimony www.panda.org/arctic).

B. Climate Impacts on Polar Bear Prey

Sea ice also is the preferred habitat for polar bears' main prey: ringed and bearded seals (Smith 1980). Polar bears are specialists on these phocid seals, only rarely and opportunistically taking other prey, like walrus, small whales, or other seals (Derocher et al. 2002). Of concern is how accessible prey species will be in an altered sea ice environment. Sea ice is the physical platform from which polar bears hunt; they only rarely capture prey successfully in open water (Furnell and Oolooyuk 1980). The emerging warmer climate regime is likely to negatively impact polar bears both by reducing the duration, thickness, and extent of available hunting habitat (as described above) and also by reducing populations of these two obligate prey species, which, like polar bears, are sensitive to perturbations in the sea ice environment and related changes in primary productivity (Derocher et al. 2004). In illustration of this, changes in ice characteristics have been documented to have a significant negative effect on population size and recruitment of ringed seals and subsequently of polar bears (Stirling 2002). Thus, predicted and observed changes in its distribution, characteristics, and timing of sea ice certainly have the potential to profoundly and negatively affect the species at the population level (Stirling and Derocher 1993, Derocher et al. 2004).

C. Climate Impacts on Polar Bear Reproduction and Survival

Changes to ice habitats also affect polar bear denning opportunities, ultimately reducing population reproductive success. For pregnant bears that den on land, ice must freeze early enough in the fall to allow them to walk or swim to the coast. As the distance from ice edge to coasts increases, it will become progressively more difficult for them to reach their preferred locations (Derocher et al. 2004). For females that den on multiyear ice rather than stable land, increased drift rates of this habitat could mean longer distances to travel with new cubs to reach the core of their normal home range (Derocher et al. 2004).

Such increased energy expenditure by individual polar bears could result in both lower survival and reproductive rates in the long term (Derocher et al. 2004) by reducing stores of fat tissue, thereby impacting body condition.

D. Other Threats to Polar Bears

1. Oil and Gas Development and Transport

Active oil and gas exploration, extraction, and transportation activities are increasing throughout the Arctic. As bear populations are compromised due to climate-related stress, the increase of offshore oil activities represents a particular concern. Polar bears are sensitive to oiling in the event of a spill (Stirling 1990), and their behaviors can be affected by disturbances related to hydrocarbon development (such as seismic blasting and infrastructure development; Derocher et al. 1998). Currently proposed offshore extraction activities pose the greatest threat to polar bears, especially if a spill occurred near a polar bear denning site (Isaksen et al 1998). Also, spills in frozen or partially frozen Arctic waters are hard to detect and no method has proven effective for clean up in this environment.

Finally, should climate warming lead to an open northern shipping route, the threat of a spill would be presented to more northerly polar bear populations, such as Alaska's bears in the Chukchi Sea. Recent accidents and near-misses in Alaska's Aleutian Islands, such as the grounding of the cargo freighter *Selendang Ayu* in 2004, have demonstrated the challenges in responding to such incidents in remote and rough waters of the north.

2. Pollutants and Disease

Many persistent organic pollutants (POPs), as well as heavy metals and radioactive elements, can reach high levels in polar bears due to their high fat diet and high trophic position (Norstrom et al 1998). Studies have demonstrated that such chemicals can negatively impact endocrine function (Skaare et al. 2001), immune function (Bernhoft et al 2000), and subsequent reproductive success (Derocher et al. 2003). Immune-compromised, not to mention hungry, bears may be more susceptible to disease or parasites. The northern expansion if range of disease organisms and the nearly complete lack of such organisms in polar bears' evolutionary past also make them vulnerable to novel pathogens (Derocher et al. 20004). Finally, environmental pollutants can cause pseudo-hermaphroditism in female bears, as has been observed in Svalbard, further reducing population reproductive rates.

3. Increased Aggressive Human-Bear Interactions

It has been predicted that human-bear interactions would increase as a result of climate-induced changes to polar bear habitat (Stirling and Derocher 1993). There is a documented correlation between date of ice break-up in spring and number of "problem" bears reported in some communities (Stirling et al 1999). More bears on land, especially if they are hungry, can lead to more attacks on humans and, correspondingly, more "defense of life and property" killings of bears. Just this year, in a remote village on Russia's Chukotka Peninsula, a young woman was killed by an unusually aggressive bear; this was the third reported bear shooting in Russia this winter.

4. Illegal Harvest of Polar Bears

Harvesting of polar bears has historically been the main threat to the species, but this has been largely mitigated through various management regimes (Prestrud and Stirling 2002). However, in some parts of the bears' range, poaching is still a problem that can have profound effects on population persistence. For example, the unregulated harvest of Chukchi Sea polar bears in Russia appears to be significant and raises concern about the status of this population. Notably, large numbers of polar bear hides have been offered for sale on the internet in Russia. Although it has not been proven that the source of these hides is Chukotka, we do know this population is vulnerable to illegal hunting. Although actual harvest levels are unknown, an estimated 250-300 polar bears were illegally taken on Russia's Chukotka Peninsula in 2002. Experts believe this harvest was at least twice the level experienced in previous years and likely resulted from the large number of bears that were stranded on land by an early ice retreat (Ovsyanikov 2003). A recent population viability analysis indicated that, even at a harvest level of 180 bears/year, there would likely be a 50% reduction in this population (which is shared with the U.S.) size within 18 years (Schliebe 2003).

II. Protecting the Polar Bear

This section examines protective measures in place domestically and internationally to protect the polar bear, points out our shortcomings, and demonstrates how listing the polar bear under the Endangered Species Act could help the polar bear.

A. Existing Protections

Currently, polar bears in the United States are protected under the Marine Mammal Protection Act ("MMPA"), enacted in 1972. The primary focus of this legislation, with respect to polar bears, has been the management and reporting of the limited legal harvest of polar bears by Alaska Natives. The MMPA also sets the conditions for specific activities in polar bear habitats, such as oil and gas exploration, development, and production. The MMPA protects the right of Alaskan natives to conduct subsistence harvest of polar bears. MMPA regulations played an important role in curbing rampant trophy hunting that was decimating polar bears throughout their range in the Arctic.

Elsewhere in the Arctic, other protective measures are in place. In Russia, polar bears have been included in the Red Data Book of Rare and Endangered Species and important polar bear habitat has been protected. Wrangell Island, known as the "polar bear nursery" for its large concentration of maternity dens, was designated in 1976 as a federally protected strict nature reserve, and surrounded with a 30-mile marine buffer zone. Russia continues to protect polar bear habitat, as evident in the establishment of regional sanctuaries, national parks, and community-managed areas in the Arctic. In Norway, hunting is prohibited and large protected areas have been established around polar bear habitat. In Canada, the species is under consideration for addition to the Species At Risk Act (SARA) list.

There are two international legal instruments to which the US is a party that commit the US government to protecting the polar bear and its habitat. The first is the 1973 International Agreement on the Conservation of Polar Bears. This treaty, like the MMPA, grew out of concern in the 1950s and 1960s about the increase in sport hunting of polar bears and the decline in polar bear populations throughout their range. High numbers of bears were being hunted as trophies for their hides. Those opposed to listing the bear under the ESA correctly point out that today polar bears are more numerous than they were 40 years ago. Throughout the 20th century, across the Arctic, from Canada to Russia, bears were being over-hunted. One scientist estimated that more than 150,000 polar bears had been taken in Eurasia between the late 18th Century and the late 1970s (Stirling, I, 2002). However, action was taken to recover polar bears.

Ironically, considering the State of Alaska's position against listing the polar bear (See "Bearing Up, New York Times editorial by Alaska Governor Sarah Palin, Jan. 5, 2008), the move to protect polar bears 40 years ago was in large part due to the efforts of an Alaskan leader. In 1965 Secretary of Interior Stewart Udall credited Alaska's Senator Bartlett with "awakening the public interest in the preservation of the polar bear" (see attached FWS press release). It was thanks to Senator Bartlett that the first international meeting of polar bear experts was convened – and hosted at the University of Alaska, Fairbanks—to address the problem of declining polar bear populations. Out of this first international event held in September, 1965, grew the Polar Bear Specialist Group (PBSG) (Young and Osherenko 1993). Formed in 1968, the PBSG today is considered the preeminent scientific body regarding polar bears.

Following two more meetings of the new Polar Bear Specialist Group and a series of draft protocols on protecting polar bears, four nations agreed to meet in Oslo, and representatives of Canada, the US, Norway, and Denmark sign the International Agreement on the Conservation of Polar Bears. (Later the Soviet Union would sign). In 1981 the five range states agree to extend the agreement indefinitely, and today this agreement is still in force.

Most notable for today's discussion is Article II of the Agreement, which states that "*Each Contracting Party shall take appropriate action to protect the ecosystems of which polar bears are a part, with special attention to habitat components, such as denning and feeding sites and migration patterns, and shall manage polar bear populations in accordance with sound conservation practices based on the best available scientific data.*"

Further reinforcing this point, Article IV states that *"Each Contracting Party shall enact and enforce such legislation and other measures as may be necessary for the purpose of giving effect to this agreement."* Protecting the polar bear under the Endangered Species Act constitutes one of those necessary measures.

Another international agreement, which was negotiated over many years, is the US-Russia Agreement on the Conservation and Management of the Alaska-Chukotka Polar Bear Population. The agreement was signed by both countries in 2000, then ratified by the US Senate in 2003 and went into effect in 2007. As a preamble to the agreement, both parties affirmed *"that the United States and the Russian Federation have a mutual interest in and responsibility for the conservation of the Alaska-Chukotka polar bear population"* and recognized that "*reliable biological information, including scientific data and traditional knowledge of native people, serves as the basis for development of an effective strategy for the conservation and management of this population.*" Article III describes that area as being affected by the treaty as "*the waters and adjacent coastal areas subject to the national jurisdiction of the Contracting Parties in that area of the Chukchi, East Siberian and Bering Seas….*" The US-Russia polar bear agreement requires both countries to protect and sustainably manage the shared population of polar bears, whose home range includes both Russian and Alaskan portions of the Chukchi Sea.

While these treaties represent important milestones in polar bear conservation, there are some shortcomings. For example, there have been few meetings of the Parties since the signing of the treaty. Until the US hosted a meeting in June of 2007, the last conference of the parties had been in 1981. The treaty lacks a mechanism to adequately monitor the effectiveness of its overarching goal, and there is an insufficient connection between the Polar Bear Specialist Group and the Agreement (Bankes and Clark, 2007). Finally, there is currently no range-wide, internationally agreed-upon species action plan.

While the US works with its international partners to strengthen this treaty, it should take a stronger stand by listing the polar bear and activating the necessary measures under the ESA. Today, polar bears face a new threat – climate change – and action is needed just as it was forty years ago.

B. The Next Step in Protecting Polar Bears: Listing Under the ESA

The Endangered Species Act (ESA) was intended by Congress to provide a means to protect endangered and threatened species as well as the ecosystems on which they depend. Listing the polar bear under the ESA requires the federal government to take actions not available under other regulatory mechanisms for the protection of listed species.

For example, if the polar bear is listed, the US Fish and Wildlife Service will be required to identify and protect critical habitat for the polar bear. The Service will also be obligated to develop a recovery plan, which provides a science-based "road map" that guides managers responsible for the species. A recovery plan should include site-specific actions, estimates of time and cost of the recommended measures, and criteria for "de-listing" the species.

Additionally, if the polar bear is listed as threatened, the federal government will be required to identify and designate "critical habitat" for the polar bear. The Endangered Species Act defines "critical habitat" as "specific areas within the geographical area occupied by the species" which contain "physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection. Critical habitat can also include "specific areas outside the geographical area occupied by the species."

Finally, the listing of the polar bear under the ESA will prohibit any federal action from jeopardizing the continued existence of the species, or adversely modifying its critical habitat.

WWF supports the USFWS recommendation to list the polar bear as threatened under the ESA. This position is based on:

1) The preponderance of scientific, peer-reviewed papers and studies on the impacts of climate change to the Arctic sea ice

2) The numerous reports over several years from the Polar Bear Specialists Group indicating concerns about the status of polar bears, and the series of reports by our own federal agency, the US Geological Survey, that two-thirds of the world's polar bears could be lost if current climate trends continue.

3) The legal mandate of the Endangered Species Act to protect a species "threatened" or "endangered" species when any of the following criteria are met:

(1) The present or threatened destruction, modification, or curtailment of its habitat or range;
(2) Over-utilization for commercial, recreational, scientific, or educational purposes;
(3) Disease or predation;
(4) The inadequacy of existing regulatory mechanisms;
(5) Other natural or manmade factors affecting its continued existence.

The volume and gravity of scientific, peer-reviewed papers and studies on the impacts of climate change to the Arctic have increased significantly in the last several years and provide a compelling body of science to justify the listing of the polar bears as threatened under the Endangered Species Act.

In the last two years alone, several major studies – including the Noble Prize-winning report by the Intergovernmental Panel on Climate Change (IPCC, 2007), have been co-authored and peer-reviewed by hundreds of well-respected scientists that document evidence of global climate change. These experts have reached widespread agreement that (1) climate change is real; (2) human-caused pollution is the main contributing factor; and that (3) the Arctic is one of the regions experiencing climate change most acutely.

One widely accepted scientific study suggests that abrupt reductions in the extent of summer ice are likely to occur over the next few decades, and that near ice-free September conditions may be reached as early as 2040. In December, 2007, Dr. Jay Zwally of NASA predicted that summer sea ice may be gone as early as 2012 (Associated Press 2007).

Besides diminishing sea ice, other impacts in the Arctic that are already being observed include: shrinking glaciers, thawing permafrost, and Arctic "greening" (encroachment of shrubs and trees into tundra ecosystems) validate -- and in many cases -- exceed predictions made regarding temperature trends, reductions to annual sea ice during the summer and winter periods, reductions to multi-year pack ice and reductions to ice thickness.

For several years, polar bear scientists have recognized these changes and have been warning us about the potential impacts to polar bear habitat from climate changed-induced loss of sea ice.

In 2004, Canada's leading polar bear biologists wrote that: "...polar bears are constrained in that the very existence of their habitat is changing and there is limited scope for a northward shift in distribution. Due to the long generation time of polar bears and the current pace of climate warming, we believe it unlikely that polar bears will be able to respond in an evolutionary sense. Given the complexity of the ecosystem dynamics, predictions are uncertain but we conclude that the future persistence of polar bears is tenuous" (Derocher et al., 2004).

In 2005, polar bear biologists from throughout the world recommended that the World Conservation Union (IUCN) reclassify the polar bear from *Least Concern* to *Vulnerable* (one of the categories which describes species that are "threatened with global extinction"), and the following year, IUCN did indeed add the polar bear to this category.

In 2007, scientists of the US Geological Survey produced a series of compelling reports indicating that if global climate trends continue, two-thirds of the world's polar bear populations could be lost. Among those populations that could witness localized extinctions are the Chukchi and Beaufort Sea populations.

The weight of scientific evidence supports the contention that polar bears' habitat is fast disappearing and that predicted individual and population level effects are already occurring. In the two best-studied polar bear populations in the world, the Western Hudson Bay and the Southern Beaufort Sea, we have witnessed population declines that correlate directly with the decline in Arctic Sea ice.

The sad and undeniable truth is that we are rapidly losing the polar bear's most important key to survival – its sea ice habitat. And there is unequivocal evidence for this: federal agencies have documented late summer Arctic sea ice declining by 7.7 percent per decade, and the perennial sea ice area declining up to 9.8 percent per decade since 1978. In some places, the Arctic sea ice has been shown to be thinning by 32 percent or more from the 1960's and 1970's to the

1990's. These figures are presented in peer-reviewed published data to which Alaska scientists had substantial input. So when Alaska government representatives and other opponents to the listing say that the proposed listing is "based on uncertain modeling of possible effects" (Compass, December 18, 2007) it is surprising to biologists and climatologists around the world. The facts are no longer "uncertain" or "possible" – we are seeing the impacts along the Bering Sea coast from Alaska to Russia.

It is clear that the listing of the polar bear as a threatened species is warranted chiefly because of the "threatened destruction, modification, or curtailment" of polar bear habitat or range, i.e. the sea ice. This is the primary Endangered Species Act standard that counsels listing of the polar bear.

Alaska has some of the world's best polar bear scientists, including one of the leading authors of the now-famous US Geological Survey (USGS) study that was released in September 2007. Based on the status of sea ice and polar bears, the USGS report warns that two-thirds of the world's polar bear populations could be lost by 2050. Other peer-reviewed research has shown negative impacts of declining sea ice. In the western Hudson Bay population, which is not "stable" but decreasing, the ice breaks up three weeks earlier than it did 20 years ago. Scientists have recorded nutritionally stressed bears, lower survival in the population, and a 22 percent population decline.

In another dramatic example of the consequences of shrinking sea ice to polar bears, scientists in 2004 found four dead polar bears floating in the ocean 60 miles offshore of northern Alaska, at a time when the polar ice cap had retreated a record 160 miles north of Alaska's coast. This led a marine biology professor at the University of Alaska to state: *"For anyone who has wondered how global warming and reduced sea ice will affect polar bears, the answer is simple – they die."*

C. Potential for Adverse Impacts to Polar Bears and their Habitat

Currently, as the USFWS deliberates over whether to list the polar bear as threatened under the ESA, another federal agency, the Minerals Management Service, is weighing an important decision which could have some significant impacts on polar bear habitat: the conducting of Lease Sale 193, nearly 30 million acres offshore in Alaska's Chukchi Sea, for oil and gas development.

1. The Chukchi Sea: Why It Matters

Until recently, few people in the American public knew where the Chukchi Sea is located, or why it matters. Yet this Arctic body of water, nestled north of the Bering Strait between Russia and Alaska, is one of the world's most productive seas. Fed by nutrient-rich currents from the Bering Sea and the Arctic Ocean, the Chukchi Sea supports a diverse and dynamic web of life. At the base of food chain are prodigious plankton communities that thrive along the ice edge. They, in turn, support ocean bottom shellfish, and crustaceans, and forage fish, which provide important prey for sea ducks, seabirds, walrus, ice seals, whales, and other marine species. These include populations of ringed and bearded seals which provide a high-energy food source for the ultimate predator at the top of this food chain -- the polar bear.

In addition to polar bears, numerous whale species, walrus, seals, birds and fish exist in the Chukchi Sea. For example, bowhead whales, including mothers and calves, migrate through the Chukchi lease sale area. Gray whales summer in the lease sale area, parts of which (e.g. the Hannah Shoal) contain important feeding habitat. Gray whale use of the Chukchi Sea is increasing, likely as a result of changing prey regimes due to climate change.

The Chukchi Sea provides the "main feeding grounds" for walrus, which are a "species of special concern." This is due to "the importance of offshore habitats within the Chukchi, the documented sensitivity of walruses to anthropogenic disturbances, and the significance of walrus hunting to the economy and culture of indigenous communities in Alaska and Chukotka."

The sea is also home to the Stellar and Spectacled Eider, both of which are protected under the Endangered Species Act (ESA). A portion of the Chukchi Sea, Ledyard Bay, is so important to continued survival of the North Slope breeding population of spectacled eider – the majority of which molt in the bay each summer – that it has been designated as critical habitat under the ESA.

2. Leasing in the Chukchi Sea: a Cause for Concern

WWF joins the conservation community in its grave concern over plans by Minerals Management Service (MMS) to conduct Sale 193 in the Chukchi Sea. This concern is based on several factors:

(i) A series of scientific comments provided by numerous federal agency experts who believe that the Chukchi Sea – and another important place for marine life, the North Aleutian Basin (otherwise known as Bristol Bay) -- should not have been included in the 2007-2012 MMS' Five Year Program for oil and gas development of the Outer Continental Shelf.

(ii) Minerals Management Service's own recognition of the high probabilities of oil spills that could result from development of the Chukchi Lease sale area. Specifically, MMS states that there is a 40% chance of a large crude oil spill; 26% for a pipeline spill; and 19% for a platform spill. MMS also estimates that 179 small crude oil spills could occur, totaling 1,214 barrels, or over 50,000 gallons of oil, in this region (Final Environmental Impact Statement for Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea).

(iii) The USFWS in its proposed ruling to list the polar bear stated that although there have been few direct mortalities associated with oil and gas activities, "the greatest concern for future oil and gas development is the effect of an oil spill or discharges in the marine environment impacting polar bears or their habitat."

(iv) To date, there is no proven technology to contain oil spills in the Arctic ice environment. And, unfortunately, there have been thousands of spills already on the North Slope – on land. Over 4,000 spills totaling 1.9 million gallons of toxic substances occurred during a nine-year period, according to the Alaska Department of Environmental Conservation (Alaska Department of Environmental Conservation spill database 1996-2004 (no villages, DEWlines). If this record is any indication of what is to be expected in terms of oil spills and environmental contamination, offshore development in the Chukchi Sea would be highly irresponsible. Indeed, the infrastructure and preparedness in place to address even small spills in the icy, Arctic environment of the Chukchi Sea do not even exist.

3. Overview of the Threat of Oil and Gas to Polar Bears in the Chukchi Sea

Given the importance of the Chukchi Sea to polar bears and the growing climate-induced threats to this species, WWF is concerned about the proposed oil and gas leasing in the region. These concerns are bolstered by the following facts:

(i) A series of scientific comments were provided to MMS by numerous federal agency experts who believe that the Chukchi Sea – and another important place for marine life, the North Aleutian Basin (otherwise known as Bristol Bay) -- should not have been included in the MMS Five Year Plan for the OCS.

For example, in two separate formal written submissions to MMS, the National Marine Fisheries Service (NMFS) raised concerns about MMS's lack of scientific data about how drilling in these Arctic waters could affect wildlife and Native cultures. In comments dated April 10, 2006, NMFS recommended that MMS remove the Chukchi Sea entirely from its proposed 5-year plan due to the critical lack of science:

"The NMFS Alaska Region believes the proposed leasing schedule is unrealistically ambitious and would not allow for necessary environmental research . . . This is particularly true for the North Aleutian Basin (Bristol Bay) and Chukchi Sea proposed sales. ***The NMFS Alaska Region recommends deletion of these areas and initiation of a comprehensive research program to support future plans subsequent to the 2007-2012 plan*** *. . . For instance, MMS states repeatedly that little is known about the distribution, abundance, behavior, and habitat use of marine mammals in the Chukchi Sea, and the few existing studies are very dated. It is extremely important to gain a better understanding of these issues prior to any exploration, leasing, or development. The need for baseline data on the distribution of marine mammals in the Chukchi Sea is particularly urgent" (*NMFS Comments on Department of the Interior's Minerals Management Service (MMS) Draft Proposed Outer Continental Shelf (OCS) Oil and Gas Leasing Program 2007-2012, dated April 10, 2006).

Again on January 30, 2007, NMFS raised its concerns with MMS about MMS' lack of scientific understanding of the potential impacts on polar bears, whales, walrus, sea lions and other wildlife from drilling in the Chukchi Sea. NMFS also pointed out serious issues with potential impacts on Native cultures and traditional ways of life:

"*We remain very concerned about potential impacts to living marine resources and their habitats, fisheries, and subsistence uses of marine resources as a result of lease sales, exploration, and development in the Chukchi Sea Planning Area. The individual and cumulative effects of development in these relatively pristine environments could be significant . . .* [Yet MMS's] data to describe marine mammals within the sale area and their habitat use are lacking or inadequate . . . Some of these [scientific data] gaps are striking given the ecological, social and cultural importance of the marine mammals in question" (Comments of the National Marine

Fisheries Service on the Minerals Management Service (MMS) Draft Environmental Impact Statement for the Chukchi Sea Planning Area, January 30, 2007).

(ii) MMS's EIS recognized that there is a 40% chance of a large crude oil spill; 26% for a pipeline spill; and 19% for a platform spill (Final Environmental Impact Statement for Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea).

MMS admits that 750-1,000 oil spills are likely from its proposal to open-up the Chukchi Sea to oil and gas development (MMS's Environmental Assessment for the Proposed Oil and gas Lease Sale 20, Beaufort Sea Planning Area, p. 97 and MMS's Chukchi Sea Planning Area Oil and Gas Lease Sale 193 and Seismic Surveying Activities Draft Environmental Impact Statement. 2006. http://www.mms.gov/alaska/ref/EIS%20EA/Chukchi_DEIS_193/DEIS_193.htm).

While clearly the overwhelming threat to polar bears today is the loss of sea ice habitat and access to prey, we must consider other sources of stress to the species. Oil and gas development is certainly one of those sources.

a) Oil and Gas as a Threat to Polar Bears

Polar bears are sensitive to oiling in the event of a spill (Stirling 1990), and their behaviors can be affected by disturbances related to hydrocarbon development, such as seismic blasting and infrastructure development (Derocher et al 1998). In 2001, the Polar Bear Specialist Group, in its final proceedings, stated that "Industrial development of oil and gas resources and a consequent increase in shipping are main concerns as future threats for polar bears and their habitats (Isaksen et al 1998).

At its next international meeting in 2005, the IUCN Polar Bear Specialist Group cautioned that "Expansion of winter-time petroleum exploration and development in the Arctic has increased concerns that oil and gas activities could disturb denning polar bears, resulting in premature den abandonment and cub mortality" (IUCN Polar Bear Specialists Group 2005). Sources of disturbance include noise and vibration from exploratory drilling, construction of ice roads and ice pads, aircraft and ground traffic. Although some experiments have been conducted testing noise levels inside artificial dens, the experts concluded that "there is currently a lack of pertinent information that is necessary to determine how industrial noise and vibration effects on polar bears should be mitigated." Currently the petroleum industry is required to avoid a one-mile buffer around known polar bear den sites. However, the PBSG has pointed out that this distance was arbitrarily established and the required buffer can be overridden if the USFWS provides authorization for "incidental taking" (IUCN Polar Bear Specialists Group 2005).

Also, spills in frozen or partially frozen Arctic waters are hard to detect and no method has proven effective for clean up in this environment. Finally, should climate warming lead to an open northern shipping route, the threat of a spill would be presented to more northerly polar bear populations, such as Alaska's bears in the Beaufort and Chukchi Seas alike.

b) Oil and Gas as a Threat to Other Wildlife Species

Oil threatens nearly all arctic wildlife, and as an apex predator, the polar bear can be harmed if other wildlife is oiled. This section summarizes some of the impacts that oil activities can have on other wildlife.

Oil spills can affect wildlife in numerous ways, depending on location, timing, and weather at time of spill, as well as the type of oil spilled. As oil "weathers" it can adhere to wildlife even more. Marine wildlife will not necessarily avoid an oil spill and in fact may be attracted to slicks that can appear like floating food.

Known impacts resulting from oil, usually crude and bunker fuels, include but are not limited to:

- hypothermia in birds by reducing or destroying the insulation and waterproofing properties of their feathers;
- hypothermia in seal pups by reducing or destroying the insulation of their fur;
- marine mammals such as fur seals become easy prey if oil sticks their flippers to their bodies, making it hard for them to escape predators;
- birds sink or drown because oiled feathers weigh more and their feathers cannot trap enough air to keep them buoyant;
- birds lose body weight as their metabolism tries to combat low body temperature;
- marine mammals lose body weight when they can not feed due to contamination of their environment by oil;
- disguise of scent that seal pups and mothers rely on to identify each other, leading to rejection, abandonment and starvation of seal pups;
- damage to the insides of animals and birds bodies, for example by causing ulcers or bleeding in their stomachs if they ingest the oil by accident.

Other types of less direct impacts of spills can be felt by wildlife. For example, oil persisting in the environment or oil that is ingested can cause:

- poisoning of wildlife higher up the food chain if they eat large amounts of other organisms that have taken oil into their tissues;
- interference with breeding by making the animal too ill to breed, interfering with breeding behavior such as a bird sitting on their eggs, or by reducing the number of eggs a bird will lay;
- damage to the airways and lungs of marine mammals;
- damage to and suppression of a marine mammal's immune system, sometimes causing secondary bacterial or fungal infections;
- damage to red blood cells;
- organ damage and failure such as a bird or marine mammal's liver;

- damage to a bird's adrenal tissue which interferes with a bird's ability to maintain blood pressure, and concentration of fluid in its body;
- damage to fish eggs, larvae and young fish;
- interference with a baleen whale's feeding system by tar-like oil, as this type of whale feeds by skimming the surface and filtering out the water.

(From the Australian Maritime Safety Authority: http://www.amsa.gov.au/marine_environment_protection/educational_resources_and_information/teachers/the_effects_of_oil_on_wildlife.asp).

iii) In its proposed ruling to list the polar bear the USFWS stated that although to date there have been few direct mortalities associated with oil and gas activities, "the greatest concern for future oil and gas development is the effect of an oil spill or discharges in the marine environment impacting polar bears or their habitat." (US Fish and Wildlife Service Proposed Rule pp 1079-1080. Federal Register Vol 72, No 5. Jan 9, 2007])

USFWS noted in its ruling that such activity is "increasing as development continues to expand throughout the United States Arctic and internationally, including in polar bear terrestrial and marine habitats.

Echoing the cautions expressed by the National Academy of Science when it issued a report on cumulative impacts of oil development on Alaska's north slope, the USFWS noted that "A major spill in the Beaufort sea would have major impacts on polar bears and ringed seals. (US Fish and Wildlife Service Proposed Rule pp 1079-1080. Federal Register Vol 72, No 5. Jan 9, 2007).

iv) To date, there is no proven technology to contain oil spills in the Arctic ice environment.

Of great concern in the Chukchi Sea is the lack of known technology to contain and recover oil spilled in the marine environment. In a report resulting from an expert panel examining cumulative impacts of oil development on the North Slope, the National Academies of Science publication concluded that: "no current cleanup methods remove more than a small fraction of oil spilled in marine waters, especially in the presence of broken ice." (NRC 2003)

This message has been repeated in other parts of the world, as well, such as in Norway. A 2006 study examining methods to recover spilled oil in the Barents Sea pointed to the difficulty of operating in ice conditions, citing the usual long distance to infrastructure; increased viscosity of the oil; migration of the oil in the ice; spillage in pools and channels between ice floes, and even under the ice; difficulty in detection and monitoring spills; and other challenges. (Evers, K, Sørheim, KR and Singsaas, I , 2006).

One year ago, in examining the risks of oil development around Sakhalin Island in Russia, World Wildlife released a report called Offshore Oil Spill Response in Dynamic Sea Ice Conditions. (DeCola et al, 2006) The report is co-authored by a petroleum engineer with extensive experience on Alaska's North Slope; an Alaskan biologist with years of experience in the field of environmental compliance and drilling operations in Alaska, and a founding member of the Oil Spill Prevention and Response within the Prince William Sound Regional Citizens Advisory

Council. The report focuses on the Sea of Ohkotsk, an area where dynamic seas and long ice seasons make it in many ways similar to the Chukchi Sea. The bottom line is: **"mechanical recovery is extremely difficult in ice-infested waters; dispersants are an unproven technology; and in-situ burning has not been demonstrated in actual field tests to be effective in ice coverage above 30% or below 70%."** Where ice concentration exceeds 70%, the ice may provide natural containment, although the sea ice may transport oil great distances so that it is unavailable for response once spring break up occurs. At higher ice concentrations, significant logistical, technical, and safety challenges remain in tracking, assessing, and igniting the oil slicks and recovering burn residues."

Recently, the lack of capacity to respond to and contain spills has been quite evident, even highly developed, technologically sophisticated nations. For example, just last month in the North Sea, a large oil spill occurred in the cold waters of the North Sea, resulting in what may be the second largest spill in Norway's history. The incident occurred during the transfer of crude oil from a loading buoy to a tanker near an offshore oil platform known as Statfjord A and resulted in 4,000 cubic meters being spilled into the sea.

D. Other Concerns: Is the Race for Oil Leading to "Shortcuts" at the Expense of Our Environment?

As noted above, in pursuing the Chukchi Lease Sale 193, MMS disregarded expert opinions of other US agencies. In the past week, information released by the Public Employees for Environmental Responsibility (PEER) points out that MMS has also ignored the advice of its own experts in Alaska in its effort to expedite the permitting processes necessary to conduct lease sales. The agency ignored strong cautions of one biologist who warned about the potential for the introduction of invasive species into Alaskan waters by exploration activities. Rather, the agency "directed its scientists to exclude any assessments of the high likelihood that offshore oil drilling would introduce invasive species into Arctic waters."

"While MMS contends that it has done complete environmental assessments of its Arctic offshore drilling permits, its own specialists – many of whom have left in recent months – vehemently disagree. After he was removed from any role on invasive species issues and his work on native fish populations was altered, [the employee] resigned from MMS in disgust. In addition, MMS chose to ignore state and federal experts who seconded the warnings from MMS staff scientists." (PEER press release).

As the MMS Five Year Program unfolds in Alaska and throughout the US, such reports of internal pressure to expedited development at the cost of the best available science are alarming and must be further investigated.

III. Summary

World Wildlife Fund appreciates the efforts of this Committee and Congress more generally to investigate current and future protections for the polar bear.

In closing, I would like to say that listing this species under the Endangered Species Act is a last resort, and in essence, signifies a failure of policy and management. We have known for some time of dangers of global warming, and should have acted more expediently to address them. Had we done so, perhaps we would not be faced with the need to list this species. Before we are faced with similarly difficult decisions for other species, we should enact legislation directly dealing with global warming, such as policies that will require the energy sector to rapidly and dramatically reduce CO2 emissions. In the short term, we need to closely scrutinize and prevent all actions that may add further stress to the polar bear, including conducting oil and gas leasing in prime polar bear habitat.

Finally to summarize the points in this testimony:

- The overwhelming body of peer-reviewed science regarding the relationship of declining Arctic sea ice to declines in polar bear populations meets the statutory criteria requiring a listing as threatened under the Endangered Species Act.
- While listing the polar bear would be a very important step, the US will have to also take dramatic steps to decrease CO2 emissions, the source of global warming that is melting polar bear habitat and transforming the Arctic.
- The US has an obligation to heed the science and to uphold its international commitments to protect polar bears and their habitat.
- The US has only two polar bear populations, inhabiting the Beaufort and Chukchi Sea. We must reduce all known sources of stress to these populations, including offshore oil and gas development.
- Global experience tells us that the technology to effectively contain and clean up such spills does not exist at this time and the risks to marine life posed by offshore oil and gas development are too great.
- We must do everything possible to allow for the polar bear to persist, and to leave future generations of Americans with a chance of knowing that polar bears and other Arctic wildlife exist in the wild. Listing the polar bear will be the first step in the right direction.

Thank you for your consideration.

References

ACIA. 2004. Impacts of a warming climate: Arctic climate impact assessment. Cambridge University Press. Available at http://amap.no/acia/.

Alaska Department of Environmental Conservation spill database 1996-2004 (DEWlines).

Associated Press. Ominous Arctic Melt Worries Experts. December 11, 2007

Australian Maritime Safety Authority: http://www.amsa.gov.au/marine_environment_protection/educational_resources_and_information/teachers/the_effects_of_oil_on_wildlife.asp)

Bankes, Nigel and Clark, Douglas. 2007. Time for Action. WWF Arctic Bulletin, No. 1, 2007.

Beissinger, S.R. 2000. Ecological mechanisms of extinction. Proc. Nat. Acad. Sci. U.S.A. 97: 11688-11689.

Ceballos, G. and P.R. Ehrlich. 2002. Mammal population losses and the extinction crisis. Science 296: 904-907.

Comiso, J.C. 2002*a*. Correlation and trend studies of the sea-ice cover and surface temperatures in the Arctic. Ann. Glaciol. 34: 420-428.

Comiso, J.C. 2002*b*. A rapidly declining perennial sea ice cover in the Arctic. Geophys. Res. Lett. 29: 1956 doi 10.1029/2002GL015650.

DeCola, Robertson, T., Fletcher, S. Harvey, S. 2006. Offshore Oil Spill Response in Dynamic Ice Conditions: A Report to WWF on Considerations for the Sakhalin II Project. Alaska, Nuka Research.

Derocher, A.E., N.J. Lunn, and I. Stirling. 2004. Polar bears in a warming climate. Integr. Comp. Biol., 44: 163-176.

Evers, K, Sørheim, KR and Singsaas, I. 2006. Oil Spill Contingency Planning in the Arctic – Recommendations. Arctic Operational Platform (ARCOP). Also available: http://www.arcop.fi/reports/D4224.pdf (See page 37)

Final Environmental Impact Statement for Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea ("FEIS") at III-51 (the full FEIS is available at http://www.mms.gov/alaska/ref/EIS%20EA/Chukchi_feis_Sale193/feis_193.htm.)

Furnell, D.J., and D. Oolooyuk. 1980. Polar bear predation on ringed seals in ice-free water. Can. Field-Nat. 94: 88-89.

Grebmeier, J.M., J.E. Overland, S.E. Moore, E.V. Farley, E.C. Carmack, L.W. Cooper, K.E. Frey, J.H. Helle, F.A. McLaughlin, and S.L. McNutt. 2006. A major ecosystem shift in the northern Bering Sea. Science 311: 1461-1464.

Isaksen, K., V. Bakken, and Ø. Wiig. 1998. Potential effects on seabirds and marine mammals of petroleum activity in the northern Barents Sea. Norsk Polarinst. Medd. 154, 66 pp.

IUCN Polar Bear Specialists Group. 2001. Polar Bears: Proceedings of the 13th Working Meeting of the IUCN/SSC Polar Bear Specialist Group. 223-28 June, 2001, Nuuk, Greenland.

IUCN Polar Bear Specialists Group. 2005. Polar Bears: Proceedings of the 14h Working Meeting of the IUCN/SSC Polar Bear Specialist Group. 20-24 June, 2005, Seattle, Washington.

Minerals Management Service Environmental Assessment for the Proposed Oil and gas Lease Sale 20, Beaufort Sea Planning Area, p. 97 and MMS's Chukchi Sea Planning Area Oil and Gas Lease Sale 193 and Seismic Surveying Activities Draft Environmental Impact Statement. 2006.
http://www.mms.gov/alaska/ref/EIS%20EA/Chukchi_DEIS_193/DEIS_193.htm

National Marine Fisheries Service Comments on the Minerals Management Service (MMS) Draft Environmental Impact Statement for the Chukchi ea Planning Area, January 30, 2007.

National Marine Fisheries Service Comments on Department of the Interior's Minerals Management Service (MMS) Draft Proposed Outer Continental Shelf (OCS) Oil and Gas Leasing Program 2007-2012, dated April 10, 2006.

National Research Council (NRC) (2003). Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope. The National Academies Press. Washington, DC.

Ovsyanikov, N. 2003. Dark Times for Chukotka Polar Bears. WWF Arctic Bulletin 2.03:13-14.

Palin, Sarah. 2008. Bearing Up: Letter to the New York Times. Jan. 5, 2008.

Parkinson, C.L. and D.J. Cavelieri. 2002. A 21 year record of Arctic sea-ice extents and their regional, seasonal and monthly variability and trends. Ann. Glaciol. 34:

Prestrud, P. and I. Stirling. 1994. The International Polar Bear Agreement and the current status of polar bear conservation. Aquat. Mamm. 20. 3: 113-124.

Public Employees for Environmental Responsibility. January 24, 2008. Press Release: INVASIVE SPECIES THREAT FROM ARCTIC OFFSHORE DRILLING IGNORED: Interior Purged Scientific Concerns about Introduction of Exotics in Arctic Waters

Schliebe, S. 2003. Chukchi sea polar bears: A population concern. USFWS Factsheet. U.S. Fish & Wildlife Service, Anchorage, AK.

Serreze, M.C., J.E. Walsh, F.S. Chapin, III, T. Osterkamp, M. Dyurgerov, V. Romanovsky, W.C. Oechel, J. Morison, T. Zhang, and R.G. Barry. 2000. Observational evidence of recent change in the northern high-latitude environment. Clim. Change 46: 159-207.

Smith, T.G. 1980. Polar bear predation of ringed and bearded seals in the land-fast sea ice habitat. Can. J. Zool. 58: 2201-2209.

Stirling, I. 1990. Polar bears and oil: Ecological perspectives. *In* J. R. Geraci and D. J. St. Aubin (eds.), *Sea mammals and oil: confronting the risks*, pp. 223-234. Academic Press, San Diego.

Stirling, I. 2002. Polar bears and seals in the eastern Beaufort Sea and Amundsen Gulf: A synthesis of population trends and ecological relationships over three decades. Arctic 55: 59-76.

Stirling, I. And A.E. Derocher. 1993. Possible impacts of climatic warming on polar bears. Arctic 46: 240-245.

US Fish and Wildlife Service Proposed Rule pp 1079-1080. Federal Register Vol 72, No 5. Jan 9, 2007

Young, O and Osherenko, G (eds.): Polar Politics: Creating International Environmental Regimes. 1993. Cornell University

Attachments

Facts and Fallacies about Polar Bears: Polar Bear Listing – Dispelling Fallacies with Facts

WWF Comments to the Fish and Wildlife Service on the Proposed Listing of the Polar Bear April 10, 2006

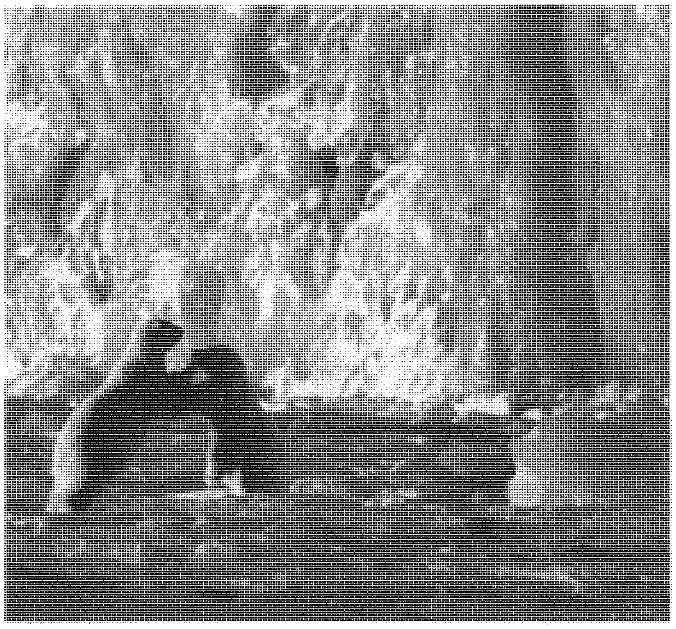
WWF Comments to the Fish and Wildlife Service on the Proposed Listing of the Polar Bear April 1, 2007

WWF Comments to the Fish and Wildlife Service on the Proposed Listing of the Polar Bear October 22, 2007 [Comment Period Reopened]

1965 USFWS Press Release: "Five-Nation Conference on Polar Bears Scheduled for September in Alaska"

WWF

Polar Bears at Risk



The material and the geographical designations in this report do not imply the expression of any opinion whatsoever on the part of WWF concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries.

Published May 2002 by WWF-World Wide Fund for Nature (Formerly World Wildlife Fund), Gland, Switzerland. Any reproduction in full or in part of this publication must mention the title and credit the above-mentioned publisher as the copyright owner. © text 2002 WWF.
All rights reserved.

Polar Bears at Risk

A WWF Status Report

by
Stefan Norris, Lynn Rosentrater and Pål Martin Eid
WWF International Arctic Programme
P.O. Box 6784 St. Olavs plass N-0130 Oslo Norway

May 2002

Table of Contents

Foreword 5
Summary 6
Introduction 7
The Bear of the Sea 8
Climate Change Impacts 11
The Hunting of Polar Bears 14
Pollution in the Arctic 15
Oil Development 17
Impacts From Other Human Activities 18
Polar Bear Management 19
Conservation Challenges and WWF Priorities 21
Conclusions 22
Appendix: National Polar Bear Management 23
Abbreviations Used in the Report 25
References 26

Acknowledgements

The authors wish to thank Drs. Ian Stirling, Andrew Derocher and Nicholas Lunn, and members of the IUCN Polar Bear Specialist Group for their significant contributions to this report. Additional thanks to Georg Bangjord, Dr. Pete Ewins, Dr. Lara Hansen, Alexander Quarles van Ufford, Samantha Smith, Birgitta van Swinderen and Dag Vongraven.

Foreword

Contrary to popular perception, the Arctic is far from being a barren vast open space. It has the largest unfragmented wilderness in the northern hemisphere, surrounded by shelf seas that are among the most biologically productive in the world. This is the kingdom of the polar bear—an ambassador for arctic nature and a symbol of the impacts that global warming is increasingly having around the world.

As the UN Intergovernmental Panel on Climate Change (IPCC) laid out in its Third Assessment Report: "Climate change in the polar region is expected to be among the greatest of any region on Earth… The Arctic is extremely vulnerable to climate change, and major physical, ecological, and economic impacts are expected to appear rapidly… A variety of feedback mechanisms will cause an amplified response, with consequent impacts on other systems and people."

Arctic nations should be leading the charge against climate change. Instead, Canada, Russia and the United States—large global warming polluters and home to most of the world's polar bears—have been in the camp of those slowest to act on global warming. It is imperative that all of these countries ratify the Kyoto climate treaty and put in place strong national policies to meet or beat Kyoto's emissions reduction targets. While Kyoto is currently the world's only defence against global warming, its targets are the bare minimum that countries should attain if we are to have a chance of preventing global warming from rendering a wide range of species extinct.

The rapid pace of change in the Artic tells us that there is no time to lose in confronting this problem. The warming trend has already resulted in a three per cent decrease per decade in the extent of sea ice since the 1970s and an increase in the number of melt days each summer. Continued shrinkage in sea ice extent will have severe repercussions on life in the Artic that will ripple through the entire arctic marine food web up to the polar bear.

As a case in point, *Polar Bears at Risk* highlights the immediate threat to polar bear populations from longer ice-free periods in the Arctic. The earlier break-up of sea ice limits the bears' hunting season and forces them to come ashore earlier. Shortening the bears' hunting season by just two weeks can lead to an eight per cent weight loss. Not only does the inability to build up sufficient fat reserves cause polar bears problems in waiting out the fasting season but the inability of mothers to lactate leads to greater mortality among cubs. The problem is most acute among the Hudson Bay population, an important source of tourism revenue to Canada.

Through its Arctic Climate Change Focal Project, WWF is supporting and working with experts and concerned groups to improve understanding of climate change impacts and find ways of strengthening the resilience of life in the Arctic to global warming.

Jennifer Morgan
Director
WWF Climate Change Program
May 2002

Summary

Polar bears, the world's largest terrestrial carnivore, spend much of their lives on the arctic sea ice. This is where they hunt and move between feeding, denning, and resting areas. The world population, estimated at 22,000 bears, is made up of 20 relatively distinct populations varying in size from a few hundred to a few thousand animals. About 60 per cent of all polar bears are found in Canada. In general, the status of this species is stable, although there are pronounced differences between populations.

Reductions in the extent and thickness of sea ice has lead the IUCN Polar Bear Specialist Group to describe climate change as one of the major threats facing polar bears today. Though the long-term effects of climate change will vary in different areas of the Arctic, impacts on the condition and reproductive success of polar bears and their prey are likely to be negative.

Longer ice-free periods resulting from earlier break-up of sea ice in the spring and later formation in the fall is already impacting polar bears in the southern portions of their range. In Canada's Hudson Bay, for example, bears hunt on the ice through the winter and into early summer, after which the ice melts completely, forcing bears ashore to fast on stored fat until freeze-up in the fall. The time bears have on the ice to hunt and build up their body condition is cut short when the ice melts early. Studies from Hudson Bay show that for every week earlier that ice break-up occurs, bears will come ashore 10 kg lighter and in poorer condition. It is likely that populations of polar bears dividing their time between land and sea will be severely reduced and local extinctions may occur as greenhouse gas emissions continue to rise and sea ice melts.

Expected changes in regional weather patterns will also impact polar bears. Rain in the late winter can cause maternity dens to collapse before females and cubs have departed, thus exposing occupants to the elements and to predators. Such rains also destroy the denning habitat of ringed seals, the polar bears' primary prey. Declines in the ringed seal population would mean a loss of food for polar bears. A trend toward stronger winds and increasing ice drift observed in some parts of the Arctic over the last five decades will likely increase energy expenditures and stress levels in polar bears that spend most of their lives on drifting sea ice.

Polar bears face other limiting factors as well. Historically, the main threat to polar bears has been hunting. Satisfactory monitoring information has been obtained for most polar bear populations in recent years, however there is concern about hunting in areas without formal quota systems, such as Greenland. A range of toxic pollutants, including heavy metals, radioactivity, and persistent organic pollutants (POPs) are found throughout the Arctic. Of greatest concern are the effects of POPs on polar bears, which include a general weakening of the immune system, reduced reproductive success and physical deformities. The expansion of oil development in the Arctic poses additional threats; for example, disturbances to denning females in the Arctic National Wildlife Refuge in Alaska could undermine recruitment of the Beaufort Sea polar bear population.

These threats, along with other effects of human activity in the Arctic, combine to pressure polar bears and their habitat. Large carnivores are sensitive indicators of ecosystem health and can be used to define the minimum area necessary to preserve intact ecosystems. WWF has identified the polar bear as a unique symbol of the complexities and interdependencies of the arctic marine ecosystem as it works toward its goal of preserving biodiversity for future generations.

Introduction

Scientists have confirmed that human-induced global warming is a reality. Over the past century, the global average surface temperature increased by about 0.6°C and the effects of this shift are becoming increasingly visible: ocean temperatures and sea levels have risen, the frequency of El Niño events has increased, and there has been an overall reduction in the extent and thickness of sea ice in polar regions (IPCC 2001a).

According to the Intergovernmental Panel on Climate Change (IPCC), even a small increase in global mean temperature may threaten a range of species with local or global extinction (IPCC 2001b). To estimate the extent to which species are threatened, Malcolm et al. (2002) investigated changes in terrestrial habitats resulting from global warming. They found that more than 80 per cent of ecoregions will suffer plant and animal extinctions due to warming resulting from a doubling of CO_2 in the atmosphere as compared to pre-industrial levels. Marine habitats, and species such as the polar bear which depend on them, are similarly vulnerable to the effects of global warming.

The IUCN Polar Bear Specialist Group considers climate change to be one of the major threats to polar bear populations. The effects of reductions in sea ice extent and thickness, shorter periods of maximum ice extent, as well as changes in sea ice dynamics and structure, may vary in different areas of the Arctic, but all have the potential to negatively influence the condition and reproductive success of polar bears and their prey.

Polar bears face other limiting factors as well. Hunting, toxic pollution, oil development, and other human activities all combine to pressure the species and its habitat. In this report we examine the effects of climate change on polar bear habitat, and put this in the context of other limiting factors, then describe the management of and conservation opportunities for this top predator.

The Bear of the Sea

The polar bear is the world's largest terrestrial carnivore, but its Latin name—*Ursus maritimus*—reflects the fact that it spends most of its life at sea. Polar bears are excellent swimmers. They can spend several hours at a time in the icy waters and cover long distances. Their preferred habitat, however, is on top of the ice that covers the arctic seas most of the year.

Ringed seals (*Phoca hispida*) are the polar bear's primary prey. These seals are a particularly energy-rich food-source for polar bears due to their high body fat content; ringed seal pups are up to 50 per cent fat at the time they are weaned. Adult bears will typically eat only the fat of their kill, whereas younger animals with a greater protein requirement for growth will eat some of the meat as well. Polar bears generally stalk their prey when the seals are on the ice resting, when they emerge from the water near the ice edge, or at breathing holes kept open by the ringed seals in the solid ice. In the spring, polar bears commonly seek out areas where ringed seal pups are kept in snow lairs dug out on the ice. The bears locate such lairs by smell and sound, and then rear up and crash through the roof of the lair to catch the pups.

Bears also prey upon bearded (*Erignathus barbatus*) and harp (*Phoca groenlandica*) seals, and when the opportunity arises young walrus (*Odobenus rosmarus*) and beluga whale (*Delphinapterus leucas*), narwhal (*Monodon monoceros*), fish, and seabirds and their eggs (Smith 1980, DeMaster and Stirling 1981).

A thick layer of fat serves both as insulation against the cold and as an energy reserve. Polar bears will devour large amounts of fat during periods when prey is available. The largest proportion of a polar bear's annual caloric intake occurs between late April and mid-July, when ringed seal pups are abundant. Ample access to food in this period is critical for maintaining body condition and ensuring reproductive success. When food is unavailable, such as during the ice-free season, polar bears fast for protracted periods. These fasting periods can last three to four months and up to eight months for pregnant females in some populations. Polar bears are unique in that they can switch from a normal metabolic state to a slowed-down hibernation-like condition in about 7-10 days at any time of the year when food is scarce (Derocher et al. 1990).

Adult males typically measure 200 to 250 cm from the tip of the nose to the tip of the tail and weigh 400-600 kg, while females are 180-200 cm in length and weigh 200-350 kg. Some males may reach 800 kg or more and pregnant females occasionally exceed 500 kg. In populations that are not over-harvested, females live into their mid or late 20s and males generally reach their early to mid-20s.

Mating takes place in April and May, but the fertilized egg does not implant until September or October, at which time pregnant females head for denning areas. Pregnant females usually dig dens in deep snow-drifts on land, while the rest of the population remains active through the winter. In the Beaufort Sea, some polar bears dig maternity dens in snow-drifts on multi-year ice floes (Lentfer 1975; Amstrup and Gardner 1994), while in western and southern Hudson Bay cubs can be born in dens excavated in frozen peat banks (Clark et al. 1997). After about two months of gestation, the cubs are born in the den. There are usually two cubs, each weighing around 600 grams and are about the size of a guinea pig. Cubs are nursed in the den on fat-rich milk until they weigh about 10 kg and are large enough to venture out onto the sea ice, which usually occurs in March or April. In most areas cubs are weaned at 2.5 years of age, making females available for mating once every three years. Small litter sizes, late maturation and the prolonged mother-offspring bond result in low reproductive rates. This means that polar bear populations are slow to recover if reduced in numbers, particularly if the reduction is due to loss of productive adult females. (Taylor et al. 1987).

Polar bears are distributed throughout the circumpolar arctic in 20 relatively distinct populations that vary in size from a few hundred to a few thousand individuals (Figure 1, Table 1). There are estimated to be at least 22,000 polar bears worldwide, with about 60 per cent occurring in Canada.

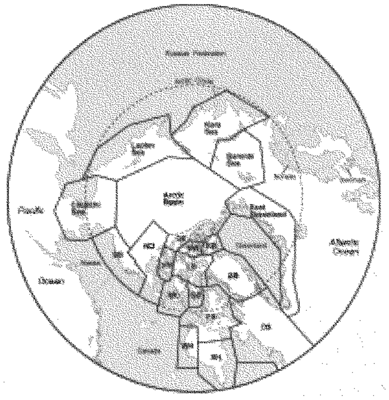


Figure 1: Circumpolar distribution of polar bear populations (courtesy IUCN Polar Bear Specialist Group).

Table 1: Polar bear population status as determined by the Polar Bear Specialist Group in June 2001. Uncertain trends are denoted by *.

Population	Abundance Estimate	Status
Arctic Basin	unknown	unknown
Baffin Bay (BB)	2200	decreasing
Barents Sea	2000-5000	unknown
Chukchi Sea	2000+	stable*
Davis Strait (DS)	1400	decreasing*
East Greenland	2000	unknown
Foxe Basin (FB)	2300	stable
Gulf of Boothia (GB)	900	stable
Kane Basin (KB)	200	stable
Kara Sea	unknown	unknown
Lancaster Sound (LS)	1700	stable
Laptev Sea	800-1200	unknown
M'Clintock Channel (MC)	350	stable*
Northern Beaufort Sea (NB)	1200	increasing
Norwegian Bay (NW)	100	stable
Queen Elizabeth (QE)	200	unknown
Southern Beaufort Sea (SB)	1800	increasing
Southern Hudson Bay (SH)	1000	stable
Viscount Melville Sound (VM)	230	stable
Western Hudson Bay (WH)	1200	stable

The distribution of polar bears is influenced by the type and distribution of sea ice, as well as the density and distribution of the seals on which they prey. In open areas such as the Beaufort Sea, polar bears are widely dispersed throughout areas of annual and multi-year ice (Garner et al. 1994). Populations in areas over the continental shelf are dispersed along the coast in active ice areas associated with shore leads, polynyas and mixed annual and multi-year ice (Stirling et al. 1993, Stirling 1997). During summer, the ice may melt in all or part of the range of a given population so that bears are forced to spend several months on land waiting for freeze-up in the fall. This pattern is most pronounced in Canada's Hudson and James Bays (Derocher and Stirling 1990, Derocher et al. 1993, Clark et al. 1997).

Individual bears in the different populations often have different spatial requirements and habitat selection strategies. Some have small home ranges (<1000 km^2) that include both land and sea ice, where the bears spend several summer months fasting on land. Others have large home ranges (>300,000 km^2), spend almost all of their time on the sea ice where there is food, and thus do not have to fast, (Ferguson et al. 1997, 2000; Mauritzen et al. 2001). Despite these differing strategies, indicating adaptability within the species, Mauritzen et al. (2001) found that individual bears are loyal to their own strategy. They do not readily shift from, for example, a small-range, land-based fasting strategy to a large-range sea-ice strategy.

The general population status of polar bears is currently stable, though there are pronounced differences between the various populations. Some populations are stable, some seem to be increasing, and some are decreasing due to various pressures. The status of some populations is not well documented.

Polar bears are on Appendix II[1] of the Convention on International Trade in Endangered Species (CITES) and are currently classified as Lower Risk/Conservation Dependent[2] on the IUCN Red List of Threatened Species. Individual countries with polar bear populations also have individual definitions of the population status and management recommendations for their respective populations.

---

[1] CITES Appendix II lists species that are not currently threatened with extinction but that become so unless trade is closely controlled.

[2] A taxon is Lower Risk when it has been evaluated and does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable; Conservation Dependent describes taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above whithin a period of five years.

Climate Change Impacts

Sea ice is the predominant feature of the arctic seas, and global warming caused by greenhouse gas emisions is expected to cause a reduction in its thickness and extent. Arctic shelf seas are among the most productive in the world and large numbers of organisms from all trophic levels can be found along ice edges, leads and polynyas where the interaction of ice, sunlight and water currents is greatest (Sakshaug et al. 1994). Reductions in the extent of sea ice will undermine the productivity of the northern oceans. Of concern as the ice melts is the loss of ice-dependant prey species for predators like the polar bear (Tynan and DeMaster, 1997). The seasonal cycle of melting ice creates vertical mixing in the ocean column and allows nutrient-rich water to reach the surface. Colony-building diatoms and blue-green algae flourish on the underside of ice floes. In the spring, as sunlight returns to the northern high latitudes and the pack ice retreats north, these algae seed a bloom of phytoplankton in the layer of nutrient-rich brackish water that forms on top of the cold, dense sea water below. Zooplankton and small crustaceans, such as copepods, amphipods and krill, feed on this bloom. These in turn, serve as food for fish (particularly arctic cod), seals, seabirds, and other predators. But it is in the open water of leads and polynyas where productivity is highest and top level predators—like the polar bear—feast on the abundance of ice-dependent species assembled there (Sakshaug et al. 1994). Due to its position at the top of the arctic marine food web, the polar bear is an ideal species through which to monitor the cumulative effects of climate change in the arctic marine ecosystem (Stirling and Derocher 1993). Indigenous communities along the coast of the northern Bering and Chukchi Seas have noticed substantial changes in the marine ecosystem since the 1970s. Alaska Natives, for example, have experienced warmer winters, early spring break-up, and thinner than usual ice (Pungowiyi 2000). This traditional knowledge echoes the scientific evidence. Throughout the 20th century, the following scientific observations have been made:

- Although not geographically uniform, air temperatures in the Arctic have increased by about 5°C over the last 100 years (Serreze et al. 2000).
- Since 1972, a 10 per cent decrease in snow-cover extent across the northern hemisphere has been observed (Brown, 2000).
- Between 1978 and 1996, arctic sea ice extent decreased by approximately 3 per cent per decade (Parkinson et al. 1999); Figure 2 illustrates that spring sea ice extent in the Nordic Sea has been reduced by 33 per cent over the past 135 years (Vinje 2001).

Sea ice is critical to the survival of polar bears. It is the platform from which they hunt because it is there that their primary prey—ringed and bearded seal—are found. Ringed and bearded seals are in turn dependent on sea ice as it is there that they rest, give birth and raise their pups. Regional variation in the seasonal distribution and extent of sea ice has been shown to have significant effects on the survival of seals and consequently on polar bears (Stirling 1997).

While different model projections of the future distribution of sea ice differ quantitatively from one to another, they agree that sea ice extent and thickness will continue to decline throughout the 21st century as the climate warms. Figure 3 illustrates this with annual mean ice extent results from two coupled models, the Geophysical Fluid Dynamics Laboratory (GFDL) Model from the United States and the Hadley Centre Model from the United Kingdom. Although the Hadley Centre Model underestimates northern hemisphere sea ice extent and thickness, the simulations of ice extent decline over the past 30 years are in good agreement and predict substantial decreases in sea ice extent and thickness over the next 50 years (Vinnikov et al. 1999). The GFDL projection shows that by the year 2050 sea ice extent will be reduced to about 80 per cent of the area it covered during the mid-1900s.

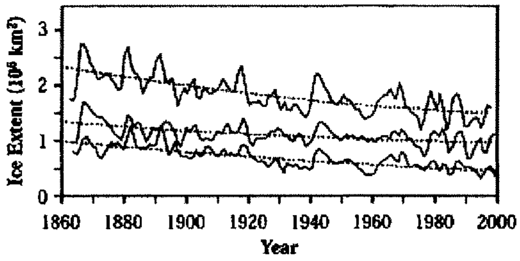


Figure 2: **The time series of April sea ice extent in the Nordic Sea (1864-1998) shows a 33 per cent reduction in sea ice extent for the entire region (top curve) and its eastern (middle) and western (bottom) areas (after Vinje 2001).**

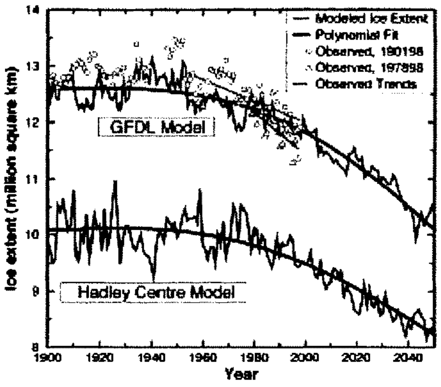


Figure 3: **Observed and modelled variation of annual averages of arctic sea ice extent. Reprinted with permission from Vinnikov et al. 1999. Copyright 1999 American Association for the Advancement of Science.**

Computer modelling by Gordon and O'Farrell (1997) predicts a 60 per cent loss of summer sea ice in the Arctic for a doubling of CO2 which translates to an increase in the summer ice-free season from 60 to 150 days. Stirling et al. (1999) suggest that hunting success in the spring enables polar bears to maximize the fat reserves necessary for survival, reproduction and lactation through the rest of the year. Longer ice-free periods resulting from earlier break-up in the spring and later sea ice formation in the fall will impact polar bear numbers in the southern portions of their range such as Hudson Bay. In these areas, bears hunt on the ice through the winter and into early summer, after which the ice melts completely so that they are forced to go ashore and fast on their stored fat until freeze-up in the fall. Thus, if the ice breaks up earlier in the spring because of climatic warming, it shortens the amount of time polar bears can hunt seals and build up their body condition. Studies from Hudson Bay show that for every week earlier that break-up occurs bears will come ashore 10 kg lighter (Stirling and Derocher 1993) and in poorer condition (Stirling et al. 1999).

Evidence has been given suggesting that changes in sea ice associated with a 1°C warming in Hudson Bay could result in a weight loss of 22 kg in females (about 8 per cent of total body weight) due to fewer days spent on the ice hunting (Stirling and Derocher 1993). Derocher and Stirling (1996) found in western Hudson Bay during the period 1980-1992 that the survival of cubs from spring to the end of the ice-free period in autumn was 44 per cent, with the main cause of death being either an absence of food or lack of maternal fat for lactation.

With reproductive success tied closely to body condition (Derocher and Stirling 1996), polar bears will likely be grossly reduced in number populations that divide their time between land and sea; local extinctions may occur as greenhouse gas emissions continue to rise and sea ice melts.

In addition to changes in sea ice extent, climate change in the Arctic is expected to bring increased precipitation (IPCC 2001b). Such a change would affect polar bears indirectly. On the one hand, ringed seals could benefit from increased snowfall. Lydersen and Gjertz (1986) investigated ringed seal lairs on Svalbard, and found that birth lairs have significantly more snow cover than lairs of adult males or sub-adults. This indicates selection by females with pups to use the heavier snow-drifts that provide added protection from predators, and subsequently results in increased pup survival. But if increased precipitation comes in the form of rain, this would melt the lairs. The population effects of this could be devastating due to the exposure of pups and increased predation (Furgal et al. 1996; Hammill and Smith 1991). In a future climate with significant increases in the frequency or amount of rain, Stirling and Derocher (1993) speculate that the increased predation by both polar bears and arctic foxes could depress the seal population enough to cause a significant decline in polar bear numbers.

Little is known about how polar bears might adapt to changes in the availability of ringed seals, although since different seal species have different affinities to specific ice characteristics (Burns 1981; Ronald and Healey 1981; Frost and Lowry 1981), the changing climate and ice conditions might favour other seal species, resulting in increases in those populations. If so, it is likely that such species would become increasingly more prevalent in the bears' diet. For example, in a preliminary analysis of fatty acids in polar bears in western Hudson Bay done by Drs. Sara Iverson of Dalhousie University and Ian Stirling of the Canadian Wildlife Service, it appears that the proportion of harbour and bearded seals in the bears' diet has recently increased (I. Stirling, pers. comm.).

Of further concern in a future of increased precipitation is the effect of adverse weather on polar bear maternity dens. Rain in the late winter can cause dens to collapse before females and cubs have departed (Clarkson and Irish 1991; Stirling and Derocher 1993). Warm spring temperatures can also thaw out a den, thus exposing its occupants to the elements and to predators. A trend toward stronger winds and increasing ice drift has been observed in some parts of the Arctic over the last five decades (Proshutinsky and Johnson 1997, Proshutinsky et al. 1999). Should this trend continue, Mauritzen (2001) shows that it would likely increase energy expenditures and stress for those polar bear populations where bears spend most or all of their time on the ice.

Temperature changes in the Arctic caused by greenhouse gas emissions have led to reductions in sea ice extent and longer ice-free periods. This trend is expected to continue throughout the 21st century.
While the effects of shorter periods of maximum ice extent, as well as changes in sea ice dynamics and structure, may vary in different areas of the Arctic, they represent the greatest challenge to the conservation of polar bears.

The Hunting of Polar Bears

Though much of the traditional harvesting from local communities has been sustainable, the IUCN Polar Bear Specialist Group (PBSG) documents that, both historically and currently, the main threat to polar bears is over-harvesting (Derocher et al. 1998).

The PBSG regularly reviews results of ongoing monitoring of the size, age and gender distributions of polar bear populations provided by the individual countries. For those populations that have functioning monitoring programs, the PBSG can estimate the status of the population.

Satisfactory monitoring information has been delivered for fourteen of the twenty populations of polar bears in recent years (see Table 1, page 12). Of these, ten are showing stable population numbers, two seem to be increasing, and two are decreasing.

Six of the twenty polar bear populations have unknown status. Some of these, for example the Arctic Basin and Queen Elizabeth populations, are in areas with few or no humans and are not harvested. However, in other areas, such as East Greenland, there is a harvest but there are no quota systems in place. The PBSG has expressed concern about this latter situation, and urges governments to initiate sound monitoring in these areas so that population estimates can be made and trends documented. Only then can the sustainability of the harvest be secured.

Today, legal hunting of polar bears by non-native sport hunters is only found in Canada. The community itself decides which proportion of the quota it has been issued is to be used for outside sport hunters.

In some of the areas lacking monitoring, such as Russia, little information is available on current hunting practices. Since it is not known if removal of polar bears is balanced against the sustainable yield of a known population size in such areas, there is reason for concern regarding the sustainability of these practices.

Pollution in the Arctic

Although polar bears live in a seemingly pristine habitat, with limited human activity, it is becoming increasingly evident that they are exposed to, and in some cases heavily impacted by, pollution and contaminants (AMAP 1997).

Local pollution can have serious effects on individuals or groups of bears. Though this is a problem to be taken seriously at the local management level, such pollution seldom threatens whole populations of polar bears. Long-range pollutants, stemming primarily from industrialized countries to the south, represent the most serious pollution-related threat to polar bears at the population level. (AMAP 1997).

High levels of heavy metals have been measured both in seals and polar bears (AMAP 1997). Some of these, for example mercury and cadmium, bioaccumulate, that is they are not readily broken down in the animal but accumulate in vital organs as the individual grows older. Mercury is a neurotoxin and can negatively affect brain development of young bears, as well as disrupt sperm production in males (AMAP 1997). Knowledge of sources, distribution pathways, and natural background values and fluctuations of heavy metals is currently limited for the Arctic. There is no evidence that heavy metals are affecting the general health of or otherwise threatening the overall polar bear population.

The general level of radioactivity in the arctic marine ecosystem has increased in the last 50 years. These increases are due mainly to testing of nuclear bombs, emissions and discharges from nuclear reprocessing plants, and accidents at nuclear power stations (AMAP 1997). Though there is no documentation of elevated levels of radioactivity in the overall polar bear population, this form of pollution remains a threat. Many reactors, both in ships, submarines and power plants, as well as large amounts of nuclear waste, are located in the Arctic, mainly in northwestern Russia. A major release of radioactivity could have serious effects on the entire marine food web in the adjacent seas, and thus on one of the top predators of this food web, the polar bear (Derocher et al. 1998).

Persistent organic pollutants (POPs) include a wide range of toxic substances, including industrial chemicals such as PCBs, by-products of industrial processes (e.g. dioxins and furans), as well as pesticides like DDT, dieldrin and lindane, and herbicides. In addition to persisting in the environment for a long time, POPs are of special concern because they are passed from species to species in increasing concentrations through the food web, and they often accumulate in vital organs over time (AMAP 1997).

As the top predator in the arctic marine ecosystem, polar bears are exposed to high levels of such environmental pollutants. Local sources within the Arctic include military installations, industry, and local application of pesticides. Long-range POPs transported to and concentrated in the Arctic via atmospheric and riverine pathways originate from the use of pesticides and other chemicals, some of which are banned in many countries, but used extensively in Russia, eastern Europe, and Asia (AMAP 1997). Though some of the local sources are significant, the long-range POPs represent the most serious population-level threat to polar bears.

Normal regulation of vitamin A and thyroid hormones is important for a wide range of biological functions, such as growth, cell differentiation, reproduction, behaviour, and the immune system. Skaare et al. (2000) have revealed that bears from Svalbard with high blood levels of PCBs, HCB, and HCHs had reduced levels of vitamin A, and that bears with high levels of PCBs and HCB showed weakened thyroid hormone systems (indicated by ratios of total versus free T4 thyroid hormone levels).

In six of the 16 sites that contributed to the State of the Arctic Environment Report (AMAP 1997) —Svalbard, North-Eastern Greenland, Wrangel Island, Eastern Hudson Bay, McClure Strait—the levels of PCBs in polar bear blubber were found to be higher than levels shown to adversely affect reproduction in mink (AMAP 1997). Several of the other sites showed values very close to this threshold value of 10,000 nanograms per gram fat. Different animal species show widely different tolerance levels towards PCBs. The levels measured in polar bears have, however, spurred further research into the effects of POPs on polar bear reproduction on Svalbard and in Canada. Alaska also has ongoing immune effects studies.

Bernhoft el al. (2000) and Skaare ct al. (2000) have shown that PCBs may be weakening the polar bears' immune systems by interfering with their production of antibodies. In polar bears with high PCB levels sampled on Svalbard between 1991 and 1994, they found significantly reduced levels of the immunoglobolin antibody IgG, which is important for combating infectious diseases. Similarly, bears with high levels of the organochlorine HCB also showed reduced levels of IgG. Small cubs may be particularly vulnerable to pollution that they receive from their mothers via the high fat content of milk, which may result in higher cub mortality (Polischuk et al. 1995, 2002).

An important comparative study of immunosuppression in polar bears from Canada, where PCB exposure is relatively low, and Svalbard, where it is relatively high, is currently underway by the Norwegian Polar Institute and the Canadian Wildlife Service. In this study, bears from the two regions were caught, blood samples were taken, and they were vaccinated with standard vaccines to provoke an immune response. After several weeks the bears were recaptured and new blood samples were taken. Several immunological parameters were measured in the two blood samples, checking for differences in immunological responses in the population with high PCB exposure versus the one with low exposure. The preliminary analysis shows that PCBs limit the ability to produce antibodies following immunization, which indicates decreased resistance to infections.

Pseudohermaphroditism (the occurrence of partially-developed male genitalia in females) has been observed in 1.5 per cent of the female polar bears sampled on Svalbard in recent years (Wiig et al. 1998). This high percentage of such malformations could be the result of hormonal disruption from environmental pollutants, although the existing data are inconclusive due to the small sample size, short time series, and lack of comparable studies from other areas.

Although current research shows that POP levels in the polar bear population on Svalbard almost certainly affect the immune system, and may lead to physical abnormalities related to reproductive hormone levels in individual polar bears living in contaminated areas, the significance of these findings on the overall population has yet to be determined. It is however evident that POPs must be included as a major impact when evaluating the sum of all human-induced impacts on the populations.

There are also grounds for additional concerns. A major source of uncertainty is the range of new, man-made persistent substances that have made their way to and are concentrated in the Arctic and that currently have unknown effects. In addition there are the known toxic and persistent substances that scientists arc not collecting, measuring or analysing due to lack of resources. These include both POPs and other contaminants, such as derivatives of stain repellents known as PFOS, and brominated flame retardants, which may have similar immune and reproductive impacts on polar bears as those already documented.

Oil Development

Petroleum exploration, extraction, transportation and processing in the Arctic affects polar bears and their habitat in many ways. There are large installations and operations already in place, and it is a growing industry in the Arctic. There is one true offshore oil production installation in the Arctic, in the Alaskan Beaufort Sea, but exploratory activities have taken place in the Barents, Kara, and Pechora Seas, the Sea of Okhotsk, as well as the Davis Strait and the Canadian High Arctic Islands. Further offshore development is expected, particularly in the Russian Arctic and in the Norwegian part of the Barents Sea. Onshore arctic oil installations are currently found in Russia, Canada, and Alaska. (AMAP 1997)

Oil and oil products pose serious health risks to polar bears (Øritsland et al. 1981; Hurst and Øritsland 1982; Griffiths et al. 1987). In the event of a spill in the marine habitat, oil will reduce the insulating effect of the bears' fur. The direct effect of losing insulation is that the bear must use more energy to keep warm, and must compensate for this energy loss by increasing its caloric intake, which may be difficult. Given that polar bears have very limited access to food for long periods of time, such an increased demand for food may result in starvation. Polar bears ingest oil after an oil spill both through grooming of their own contaminated pelts, and through scavenging and preying on contaminated seals, seabirds, or other food items. The ingested oil causes liver and kidney damage, as well as general physiological impairment, and it has long-term toxicity (Hurst and Øritsland 1982; Hurst, et al. 1991). Griffiths et al. (1987) concluded that even a brief oiling of the fur of a polar bear can kill it, primarily by poisoning through grooming, and that a large number of affected polar bears would likely die if an oil spill were to occur in prime polar bear habitat.

In addition to the oil itself, the extraction process can result in discharges of a number of toxic substances that may pose a threat to polar bears and their environment. These include both process chemicals, such as oil-based drilling muds, which can contain both heavy metals and POPs, and even naturally-occurring substances from the geological structure such as alkyphenols (WWF 2001; AMAP 1997). Also, disturbances due to seismic blasting, construction, transportation or operation of facilities, as well as disturbances and contamination in connection with oil spill clean-up operations can negatively impact polar bears (Derocher et al 1998).

Offshore operations pose the greatest risk, since routine emissions, spills or leaks will be discharged directly into the sea or on the sea ice. A large-scale spill at or near the ice edge, either from ship or installation, represents the most dangerous scenario for polar bears. If a major spill occurs at or near areas with high concentrations of polar bear denning sites, for example Hopen Island in the Barents Sea, it could have population-wide consequences (Isaksen et al. 1998).

There is currently no proven effective method for cleaning or controlling an oil spill in icy, arctic waters, where difficult weather conditions are common.

Despite these obvious negative impacts, and certain cases of individual bears or family units being disturbed, injured, or killed as a result of oil development, there is no evidence to date of population-level impacts on polar bears that can be attributed to such development. This can likely be attributed to the fact that oil development so far has been relatively limited in key polar bear habitats, and that precautions have been taken where obvious conflicts were identified. However, polar bear populations are expected to come under increased pressure if oil developments in the Arctic continue according to industry plans.

Impacts From Other Human Activities

In addition to petroleum development, other human infrastructure development and activity in the Arctic can also negatively impact polar bears. Such development includes industrial development, military installations, scientific research stations, new human settlements, road and pipeline construction, and finally the growing tourist industry, which increasingly brings large numbers of humans directly in to prime polar bear habitat and even denning areas.

Though polar bears, like other bears, have been shown to adapt well to human presence in some areas, such as Churchill on the Hudson Bay coast of Canada, expanding human development and activity will lead to habitat fragmentation. If human disturbances take place in areas with high concentrations of denning females, they could have negative affects on the polar bear populations of those areas. For example disturbances of denning females in the Arctic National Wildlife Refuge in Alaska could undermine recruitment to the Beaufort Sea polar bear population (Amstrup 1993).

Polar bears are curious and generally fearless by nature. They can be dangerous to human beings and can cause serious damage to property. Where there are polar bears and human beings in the same area, there is potential for conflict. Every year, polar bears are killed in self-defence, or to defend property. In Svalbard, for example, these are the only forms of removal from the population. In some populations, such incidental kills are subtracted from the overall harvest quota.

Currently, incidental kills do not alone threaten any polar bear population. For management purposes, however, it is important that incidental kills are included as part of the overall effect of humans on polar bear populations. The more people who live in or move through polar bear habitat, the larger will be the number of conflicts and killed, wounded, or stressed bears.

Polar Bear Management

The five arctic countries hosting polar bear populations; Canada, Russia, Greenland/Denmark, the United States, and Norway, all have different cultures, traditions, and histories regarding the management of the species. Historically, polar bear management was limited to the harvesting practices administered by communities within the range of any given polar bear population. Harvest was traditionally carried out to fulfil local needs for clothing and meat. It was not primarily a commercial trade, nor conducted with mechanized transport, and was therefore kept at sustainable levels. Adventure- and profit-seeking hunters from outside the Arctic harvested large numbers of polar bears from the 1700s through the 1800s and into the mid-1900s. As technology improved, introducing the use of aircraft, motorized vessels, rifles with telescopic sights, and set-gun traps, the overall harvest of polar bears in many areas intensified and became unsustainable (Prestrud and Stirling 1994).

Growing public concern over hunting and other human activities, such as oil exploration, led in 1965 to the first International Scientific Meeting on the Polar Bear being held in Fairbanks, Alaska. Following this meeting, the Polar Bear Specialist Group (PBSG) was formed under the Species Survival Commission (SSC) of the International Union for the Conservation of Nature (IUCN) to coordinate international research and management of polar bears (Prestrud and Stirling 1994).

The PBSG has no regulatory function but is rather a technical group consisting of government-appointed specialists, with equal representation of the five nations that have polar bear populations. The PBSG membership consists of up to three government-appointed members from each of the five nations, plus up to five members the Chair can appoint. The members are all specialists in the fields of polar bear biology, population dynamics, or wildlife management. The primary role of the PBSG is to promote cooperation between jurisdictions that share polar bear populations, facilitate communication on current research and management, and monitor compliance with the International Polar Bear Agreement.

As a follow-up to concerns identified by the PBSG, a series of negotiations were held with the aim of reaching an agreement on international polar bear management issues. In 1973, the five nations with polar bear populations finalized the *Agreement on the Conservation of Polar Bears*. The Agreement came into force in May 1976 and all five contracting parties unanimously reaffirmed continuation of the Agreement in January 1981. This agreement, established at the height of the Cold War, was the first environmental agreement to be signed by both western and eastern block arctic states. It was innovative for its time because it identified the need to protect entire ecosystems to ensure conservation of key species.

Under the agreement, the five polar bear nations are committed to:

- protecting polar bear habitat, especially denning areas, feeding areas, and migratory routes;
- banning the hunt of bears from aircraft and large motorized boats;
- conducting and coordinating management and research efforts;
- exchanging research results and data; and
- managing shared populations in accordance with sound conservation practices and the best available scientific information.

The Agreement allows for the taking of polar bears for scientific purposes, for preventing serious disturbances in the management of other resources, for use by local people using traditional methods and exercising traditional rights, and for protection of life and property. Though the Agreement itself is not enforceable by law in any of the countries that have signed it, most of its requirements have been partially or fully addressed by the passage of domestic legislation. As such, the Agreement is the single most important influence on the development of internationally coordinated management and research programs that have ensured the survival of polar bears. In Norway, the Agreement resulted in the closure of all polar bear harvest. The Agreement has also brought the harvest of polar bears within sustainable limits for most other populations, while still facilitating harvest by local people (Prestrud and Stirling 1994).

Each nation has established its own polar bear regulations and conservation practices. Many initial management changes were made during the process of negotiating the international Agreement, with a view to ensure compliance and to reduce the scope of unsustainable harvest. The Alaskan harvest rate, for example, was reduced by 50 per cent following the Marine Mammal Protection Act of 1972. An overview of polar bear management at the national level is given in the appendix.

Areas protected for polar bears

Article II of the International Polar Bear Agreement states that signatory nations "shall take appropriate action to protect the ecosystems of which polar bears are a part". This was innovative at the time of signing, but there has been relatively little follow-up of this part of the agreement in marine areas (Prestrud and Stirling 1994). Several terrestrial protected areas have nevertheless been established in the Arctic with the primary goal of protecting polar bear habitat.

United States/Alaska: The matrix of land ownership and legal authorities is complex in Alaska. Much of the land in federal ownership in Alaska is designated as National Wildlife Refuge or National Park, although no land or marine areas have been set aside strictly as polar bear habitat.

The Arctic National Wildlife Refuge on Alaska's north slope is the most important denning area in the United States for polar bears. The refuge is currently under pressure to be opened for oil and gas development.

Canada: Several National Parks, and National Park Reserves in northern Canada provide protection to polar bears in summer sanctuaries and denning areas, although in many cases this is coincidental.

Ontario's Polar Bear Provincial Park, at the junction of James and Hudson Bays, was established primarily to protect the world's southernmost polar bear population.

Wapusk National Park, which stretches along the Manitoba coast south of Churchill to the Ontario border, was established in 1996 to protect a core of the maternity denning areas. Managing the tourism generated by the high density of polar bears found near Churchill each autumn is a high priority for park authorities.

There are no Canadian offshore areas with polar bear protection status.

Greenland: An area in Melville Bay has been set aside as a polar bear reserve and the largest protected area in the world is the Northeast Greenland National Park. However, polar bear hunting is permitted within the protected areas on Greenland.

Norway: About 56 per cent of the area of Svalbard is protected as either national park or nature reserve. This protection was not established specifically to benefit polar bears but protecting polar bear habitat was an important factor when these designations were made in the 1970s.

The islands of Kong Karls Land in Svalbard's northeast archipelago is protected as strict nature reserve and some of the most important denning areas for the Barents Sea population are found here. The area is closed to the public and highly restricted even for research and government patrolling.

Russia: Wrangel Island and Herald Island are the only areas in Russia protected as strict nature reserves to preserve important polar bear denning areas. Enforcement of this protection has, however, been lacking, and the scale of local hunting is not known.

Other protected areas in northern Russia overlap polar bear habitat, but were not established with this in mind. Monitoring and enforcement in most of these protected areas has also been weak due to serious financial constraints, particularly in recent years.

Conservation Challenges and WWF Priorities

A key element of WWF's mission is to preserve biodiversity for future generations. To achieve this, large tracts comprising entire intact ecosystems must be managed on a sustainable long-term basis, and global trends threatening these ecosystems, such as human-induced climate change and the emission of POPs and heavy metals, must also be halted or reversed.

As the polar bear is a keystone species at the top of the food web in the arctic seas, which include some of the world's most productive marine ecosystems, it is a good indicator of the overall status of these ecosystems (Eisenberg 1980). Successful conservation of polar bears and their habitats can thus have positive effects on many other species, in several key ecoregions, as well as on local human communities within the Arctic. Addressing the conservation of such keystone species therefore has a high priority within WWF.

Through its work in priority ecoregions, WWF is a driving force in the protection of large expanses of unfragmented land and marine areas to ensure that space-demanding species, such as the polar bear, can continue to roam undisturbed in intact ecosystems.

Through its toxics program WWF works at the global as well as the community level to reduce the production and transportation of persistent organic pollutants and other contaminants that threaten the health and condition of polar bears.

And finally, as part of its climate change program, WWF has targeted the polar bear as a unique symbol of the complexities and inter-dependencies of the arctic marine ecosystem. The WWF Climate Change Campaign, through its Arctic Climate Change Focal Project, currently supports leading scientists in their efforts to study and monitor the effects of climate change on polar bears and the arctic marine environment in which they live.

Conclusions

Polar bears are the last remaining large terrestrial carnivore found throughout most of its original range, and in numbers similar to those of pre-industrial development. Most of the original habitat of the polar bear is still intact, although not legally protected, and much of the range occupied by the species is uninhabited by humans. From a management perspective the polar bear is thus in quite a unique and positive situation.

There are, however, serious environmental threats facing this species. These include large-scale habitat fragmentation, excessive hunting, pollution, and climate change. Though the over-harvesting of certain populations is currently the most urgent threat to bears in some areas, the IUCN Polar Bear Specialist Group considers climate change to be one of the major conservation challenges for the overall polar bear population. In the resolutions from meetings of this group held in Nuuk, Greenland in June 2001, climate change is listed as the number one threat.

A warming trend has been observed over the arctic sea ice resulting in a three per cent decrease of sea ice extent per decade since the 1970s and more melt days per summer. This trend is expected to continue. Computer models suggest that with a doubling of CO_2 in the atmosphere the ice-free season will grow from 60 days to 150 days.
As the time bears have on the ice to hunt is cut short their opportunities for developing fat reserves to survive a longer ice-free season are more limited.

There is evidence that climate change is already affecting the condition of polar bears in the Hudson Bay area of Canada. Female bears are in poorer condition going into the denning period, suggesting difficulties obtaining sufficient food while hunting on the sea ice. These observations are indicative of what can be expected throughout the polar bear distribution in the future.

The combined effects of climate change are expected to negatively impact polar bear reproductive success, and thus lead to a decline in the overall population. These effects must also be seen in the context of other pressures facing this species, including unsustainable hunting practices and contamination by persistent organic pollutants.

Appendix: National Polar Bear Management

Each polar bear nation has established its own regulations and conservation practices to ensure survival of the species.

United States/Alaska

In the United States, the U.S. Fish and Wildlife Service is responsible for management and conservation of polar bears under the terms of the Marine Mammals Protection Act (MMPA) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In 1972, the MMPA introduced a general ban on the taking of polar bears, however, harvest is allowed under specific conditions. Alaska Natives, for example, may harvest polar bears for subsistence, and for traditional handicraft and clothing. There are no quotas, but total harvest is monitored to ensure that it is within optimum sustainable levels.

In the northeast, Alaska shares its polar bear population with Canada. An agreement between indigenous groups of Alaska and Canada[3] ensures that the Beaufort Sea population is harvested and managed sustainably.

In October 2000 the governments of the United States and the Russian Federation signed the *Agreement on the Conservation and Management of the Alaska-Chukotka Polar Bear Population.* This agreement supports management of polar bears shared between the U.S. and Russia, by entering into law many of the provisions from the International Polar Bear Agreement. It requires enactment of enabling legislation by the U.S. Congress and other steps by Russia before it has the force of law. The US is expected to adopt such legislation in the spring 2002 session of Congress.

Canada

Apart from complying with the CITES, Canada's federal government has delegated the authority for the management of polar bears to its provinces and territories, some of which now share the responsibility with co-management boards through the settlement of land claims.

The harvest of polar bears is permitted in Canada, in accordance with the International Polar Bear Agreement, under various quota systems for aboriginal groups; quotas are not set in Quebec and Ontario. Hunting licenses issued from the quotas can be sold, for example to non-aboriginal sport hunters. The trade of skins, meat, and other polar bear products is regulated under CITES.

In the Northwest Territories and the Nunavut Territory, co-management agreements between jurisdictions with shared populations have been developed. Some of these include flexible quota systems to ensure that harvesting is sustainable.

The close cooperation among jurisdictions, co-management boards and other interested parties developed in recent years has resulted in polar bears being among the better managed species in Canada.

Greenland

In Greenland, polar bear hunting and management regulations are administered by the Greenland Home Rule Government. These regulations state that polar bears can only be taken by native hunters who hunt and/or fish as a full time occupation, and who have a valid hunting license. These regulations are intended to limit the take of polar bears to Inuit subsistence hunters.

---

[3] The North Slope Borough and Inuvialuit Game Council Hunter Management Agreement

There are no hunting quotas in Greenland, however, reporting and monitoring systems are under development. These systems are not yet fully functional, and there has been international concern for a number of years that the Greenlandic polar bear harvest was unsustainable. This has caused particular concern in areas where the populations are shared with neighbouring countries: Canada in the west and Norway in the east.

In November 2000, the Greenland Home Rule Government decided in principle to work toward the introduction of quotas in the catch of polar bears and to introduce other catch-regulating mechanisms. The Greenland Home Rule Government and the Government of Nunavut (Canada) continue to discuss the establishment of a memorandum of understanding between Canada and Greenland regarding the co-management of the polar bear populations they share.

As there is no current quota system based on sound population estimates in Greenland, there is also no centrally organized licensing for sport hunting.

Norway

Polar bear management in Norway is the responsibility of the Directorate of Nature Management, which is under the Norwegian Ministry of the Environment. Day-to-day decisions regarding culling or handling of problem bears are delegated to the Governor of Svalbard.

In Norway, polar bears have been protected since 1973 with the following exceptions: killing in self-defence, protection of property, and mercy-kills. The Barents Sea polar bear population is thus the only population that can be said to be truly without impacts from harvesting. There are no indigenous communities on Svalbard that can claim traditional harvesting rights. The primary human influence on polar bears on these islands is through the large and growing tourist industry. All persons travelling on Svalbard are encouraged to carry appropriate firearms for protection against polar bear attack. As tourist numbers rise, human-bear conflicts are expected to follow.

Russia

Management of polar bears in Russia is the responsibility of the Main Administration of Biological Resources under the Ministry of Natural Resources of the Russian Federation. Regional committees are responsible for management at the local level.

A federal ban on all polar bear hunting was introduced in 1956. There has, however, been no monitoring of incidental kills of polar bears since then, and there is concern for widespread poaching. The general lack of law-enforcement and Russia's economic decline has allowed poaching to increase, however, the dismantling of military installations and abandonment of related settlements has had a counter-balancing effect.

In the early 1990s, indigenous communities in Chukotka applied for harvesting rights, as polar bears have always been an important part of their subsistence and local tradition. The *Agreement on the Conservation and Management of the Alaska-Chukotka Polar Bear Population* signed by the United States and the Russian Federation in October, 2000 introduces legal harvesting of polar bears for indigenous people in the Chukotka region. The agreement has the potential to create better population estimates, and better management arrangements, and thus to ensure in the longer term, sustainable polar bear populations in the region.

Abbreviations Used in the Report

CITES	The Convention on International Trade in Endangered Species, an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. On the web at www.cites.org.
CO_2	Carbon Dioxide
DDT	A colourless, odourless, water-insoluble crystalline insecticide—C14H9Cl5—that tends to accumulate in ecosystems and has toxic effects on many vertebrates.
FWS	The United States Fish and Wildlife Service. On the web at www.fws.gov.
HCB	Hexachlorobenzene, a synthetic organochlorine pesticide also used as an industrial chemical.
HCH	Hexachlorocyclohexanes, a group of synthetic organochlorine compounds mostly used as pesticides.
IgG	A class of immunoglobolin that includes the most common antibodies circulating in the blood
IPCC	The Intergovernmental Panel on Climate Change, an international organisation initiated by the World Meteorological Union and United Nations Environmental Programme to assess the scientific, technical and socio-economic information relevant for the understanding of the risk of human-induced climate change. On the web at www.ipcc.ch.
IUCN	The International Union for the Conservation of Nature an international, an international, intergovernmental organization whose mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. On the web at www.iucn.org.
MMPA	The Marine Mammal Protection Act, a domestic act for protection of marine mammals within the waters of the United States of America.
PBSG	The Polar Bear Specialist Group, a specialist group within the IUCN/SSC network. On the web ate pbsg.npolar.no.
PCB	polychlorinated biphenyl, any of several compounds that are produced by replacing hydrogen atoms in biphenyl with chlorine, have various industrial applications, and are poisonous environmental pollutants which tend to accumulate in animal tissues.
PFOS	Perfluorooctane sulfonate, a group of compounds containing fluorocarbons.
POPs	Persistent Organic Pollutants.
SSC	The Species Survival Commission, a knowledge network within the IUCN of volunteer members working as wildlife researchers, government officials, wildlife veterinarians, zoo employees, marine biologists, wildlife park managers, and experts on birds, mammals, fish, amphibians, reptiles, plants, and invertebrates. On the web at www.iucn.org/themes/ssc.
WWF	The World Wide Fund for Nature. In the USA and Canada, WWF continues to be known as the World Wildlife Fund. On the web at www.panda.org.

References

AMAP. 1997. Arctic Pollution Issues: A State of the Arctic Environment Report. Arctic Monitoring and Assessment Programme, Oslo, Norway. 188 pp.

Amstrup, S.C. 1993. Human disturbances of denning polar bears in Alaska. Arctic **46**: 246-250.

Amstrup, S.C. and Gardner, G.W. 1994. Polar bear maternity denning in the Beaufort Sea. Journal of Wildlife Management **58**: 1-10.

Bemhoft, A., Skaare, J.U., Wiig, Ø., Derocher, A.E., and Larsen, H.J. 2000. Possible immunotoxic effects of organo chlorines in polar bears (Ursus maritmus) at Svalbard. Journal of Toxicology and Environmental Health **A59**: 101-114.

Brown, R.D. 2000. Northern Hemisphere snow cover variability and change, 1915-1997. Journal of Climate **13**: 2339-2355.

Bums, J.J. 1981. Bearded seal Erignathus barbatus Erxleben, 1777. In: Ridgway, S.H. and Harrison, R.J. (Eds.): Handbook of marine mammals. Academic Press, London. pp. 145-170.

Clark, D.A., Stirling, I. and Calvert, W. 1997. Distribution, characteristics and use of earth dens related to excavations by polar bears on the Western Hudson Bay lowlands. Arctic **50**: 158-166.

Clarkson, P.L., and Irish, D. 1991. Den collapse kills female polar bear and two newborn cubs. Arctic **44**: 83-84.

DeMaster, D.P. and Stirling, I. 1981.Ursus maritimus. Mammalian Species **145**: 1-7.

Derocher, A.E. and Stirling, I. 1996. Aspects of survival in juvenile polar bears. Canadian Journal of Zoology **74**: 1246-1252.

Derocher. A.E., Andriashek, D. and Stirling, I. 1993. Terrestrial foraging by polar bears during the ice-free period in western Hudson Bay. Arctic **46**: 251-254.

Derocher, A.E. and Stirling, I. 1990: Distribution of polar bears (Ursus maritimus) during the ice-free period in western Hudson Bay. Canadian Journal of Zoology **68**: 1395-1403.

Derocher, A.E., Gamer, G.W., Lunn, N.J. and Wiig, Ø. (Eds.). 1998: Polar bears: Proceedings of the Twelfth Working Meeting of the IUCN/SSC Polar Bear Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK. v + 159 pp.

Derocher, A.E., Nelson, R.A., Stirling, I. and Ramsay, M.A. 1990. Effects of fasting and feeding on serum urea and serum creatinine levels in polar bears. Marine Mammal Science **6**: 196-203.

Eisenberg, J. F. 1980. The density and biomass of tropical mammals. In: Conservation Biology: an evolutionary-ecological perspective, M. E. Soule and B. A. Wilcox, eds.. Sinuaer Associates, Sunderland, Mass. 395pp.

Ferguson, S.H., Taylor, M.K., and Messier, F. 1997. Space use by polar bears in and around Auyuittuq National Park, Northwest Territories, during the ice-free period. Canadian Journal of Zoology **75**: 1585-1594.

Ferguson, S.H., Taylor, M.K., and Messier, F. 2000. Influence of sea ice dynamics on habitat selection by polar bears. Ecology **81**: 761-772.

Frost, K.J. and Lowry, L.F. 1981: Ringed, Baikal and Caspian Seals Phoca hispida Schreber, 1775; Phoca sibirica Gmelin, 1788; Phoca caspica Gmelin, 1788. In: Ridgway, S.H. and Harrison R.J. (Eds.): Handbook of marine mammals. Academic Press, London. pp. 29-53.

Furgal, C.M., Innes, S., and Kovacs. K.M. 1996. Characteristics of ringed seal, Phoca hispida, subnivean structures and breeding habitat and their effects on predation. Canadian Journal of Zoology **74**: 858-874.

Gamer, G.W., Amstrup, S.C., Stirling, I., and Belikov, S.E. 1994: Habitat considerations for polar bears in the North Pacific Rim. Transactions of the North American Wildlife and Natural Resources Conference **59**: 111-120.

Gordon, H.B. and O'Farrell, S.P. 1997. Transient climate change in the CSIRO coupled model with dynamic sea ice. Monthly Weather Review **25**: 875-907.

Griffiths, D., Øritsland, N.A. and Øritsland, T. 1987. Marine mammals and petroleum activities in Norwegian waters. Fisken og Havet Serie **B1**: 1-179.

Hammill, M.O. and Smith, T.G. 1991. The role of predation in the ecology of the ringed seal in Barrow Strait, Northwest Territories, Canada. Marine Mammal Science **7**: 123-135.

Hurst F.J. and Øritsland, N.A. 1982. Polar bear thermoregulation: effect of oil on the insultative properties of fur. Journal of Thermal Biology **7**: 201-208.

Hurst, R.J., Watts, P.D., and Øritsland, N.A. 1991. Metabolic compensation in oil-exposed polar bears. Journal of Thermal Biology **16**: 53-56.

IPCC 2001a: Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panelon Climate Change [Houghton, T., Ding, Y., Griggs, D.J., Noguer, M., van der Linden, P.J., Da, X. and Maskell, K (Ed.)]. Cambridge University Press, Cambridge, United Kingdom and New York, 881 pp.

IPCC. 2001b. Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [McCarthy, J.J., Canziani, O.F., Leary, N.A., Dokken, D.J. and White, K.S.(Eds.)]. Cambridge University Press, Cambridge. United Kingdom and New York, 1032 pp.

Isaksen, K., Bakken, V. and Wiig, Ø. 1998: Potential effects on seabirds and marine mammals of petroleum activity in the northern Barents sea. Norsk Polarinstitutt Meddelelser nr. 154.

IUCN. 2001. Press release from PBSG meeting, held in Nuuk, Greenland 23-28 June 2001. See pbsg.npolar.no for more information.

Lentfer, J.W. 1975. Polar bear denning on drifting sea ice. Journal of Mammalogy **56**: 716.

Lydersen C. and Gjertz, I. 1986. Studies of the ringed seal (Phoca hispida Schreber, 1775) in its breeding habitat in Kongsfjorden, Svalbard. Polar Research **4**: 57-63.

Malcolm, J.R., Liu, C., Miller, L.B., Allnutt, T. and Hansen, L. 2002. Habitats at Risk: Global Warming and Species Loss in Globally Significant Terrestrial Ecosystems. World Wildlife Fund, Washington D.C., 39 pp.

Mauritzen, M. 2001: Isbjørnens arealbruk i Barentshavområdet. Ottar **5**: 9-16.

Mauritzen, M., Derocher, A.E. and Wiig, Ø. 2001. Space-use strategies of female polar bears in a dynamic sea ice habitat. Canadian Journal of Zoology **79**: 1704-1713.

Øritsland N.A., Engelhardt F.R., Juck, F.A., Hurst, R.J. and Watts, P.D. 1981: Effects of crude oil on polar bears. Environmental Studies 24, Northern Affairs Program, Department of Indian and Northern Affairs, Ottawa, Canada, 268 pp.

Parkinson, C., Cavalieri, D., Gloersen, P., Zwally, H. and Comiso, J. 1999. Arctic sea ice extents, area and trends, 1978-1996. Journal of Geophysical Research (Oceans and Atmospheres) **104**: 20837-20856.

Polischuk, S.C., Letcher, R.J., Norstrom, R.J., and Ramsay, M.A. 1995. Preliminary results of fasting on the kinetics of organochlorines in polar bears (Ursus maritimus). The Science of the Total Environment **160/161**: 465-472.

Polischuk, S.C., Norstrom, R.J., and Ramsay, M.A. 2002. Body burdens and tissue concentrations of organochlorines in polar bears (Ursus mariti mus) vary during seasonal fasts. Environmental Pollution **118**: 29-39.

Prestrud, P. and Stirling, I. 1994. The international polar bear agreement and the current status of polar bear conservation. Aquatic Mammals **20**: 1-12.

Proshutinsky, A. and Johnson, M. 1997. Two circulation regimes of the wind driven Arctic Ocean. Journal of Geophysical Research (Oceans and Atmospheres) **102**: 12493-12514.

Proshutinsky, A., Polyakov, I., and Johnson, M. 1999. Climate states and variability of Arctic ice and water dynamics during 1946-1997. Polar Research **18**: 135-142.

Pungowiyi, C. 2000. Native observations of change in the marine environment of the Bering Strait region. In: Huntington, H.P. (Ed.): Impacts of Changes in Sea Ice and Other Environmental Parameters in the Arctic. Report of the Marine Mammal Commission Workshop 15-17 February 2000, Girdwood, Alaska. Marine Mammal Commission, Bathesda, Maryland. 98 pp.

Ronald, K. and Healey, P.J. 1981. Harp seal Phoca groenlandica Erxleben, 1777. In: Ridgway, S.H. and Harrison R.J. (Eds.). Handbook of Marine Mammals. Academic Press, London. pp. 55-87.

Sakshaug, E., Bjørge, A., Gulliksen, B., Loeng, H. and Mehlum, F. (Eds.) 1994. Økosystem Barentshavet, Norges Forskningsråd, Universitetsforlaget, Oslo. 304 pp.

Serreze, M.C., Walsh, J.E., Chapin III, F.S., Osterkamp, T., Dyurgerov, M., Romanovsky, V., Oechel, W.C., Morison, J., Zhang, T. and Barry, R.G. 2000. Observational evidence of recent change in the northern high latitude environment. Climatic Change **46**: 159-207.

Skaare, J.U., Bernhoft, A., Derocher, A.E., Gabrielsen, G.W., Goksoyr, A., Henriksen, E., Larsen, H.J., Lie, E., and Wiig, O. 2000. Organochlorines in top predators at Svalbard: occurrence, levels and effects. Toxicology Letters **112**: 103-109.

Smith, T.G. 1980. Polar bear predation of ringed and bearded seals in the land-fast sea ice habit. Canadian Journal of Zoology **58**: 2201-2209.

Stirling, I. 1997. The importance of polynyas, ice edges, and leads to marine mammals and birds. Journal of Marine Systems **10**: 9-21.

Stirling, I. and Derocher, A.E. 1993. Possible impacts of climatic warming on polar bears. Arctic **46**: 240-245.

Stirling, I., Andriashek, D.A., and Calvert, W. 1993. Habitat preferences of polar bears in the western Canadian Arctic in late winter and spring. Polar Research **29**: 13-24.

Stirling, I., Lunn, N.J., and Iacozza, J. 1999. Long-term trends in the population ecology of polar bears in western Hudson Bay in relation to climatic change. Arctic **52**: 294-306.

Taylor, M.K., DeMaster, D.P., Bunnell, F.L., and Schweinsburg, R.E. 1987. Modelling the sustainable harvest of female polar bears. Journal of Wildlife Management **51**: 811-820.

Tynan, C.T. and DeMaster, D.P. 1997. Observations and predictions of Arctic climate change: potential effects on marine mammals. Arctic **50**: 308-322.

Vinje, T. 2001. Anomalies and trends of sea ice extent and atmosphere circulation in the Nordic Seas during the period 1864-1998. Journal of Climate. **14**: 255-267.

Vinnikov, K.Y., Robock, A., Stouffer, R.J., Walsh, J.E., Parkinson, C.L., Cavalieri, D.J., Mitchell, J.F.B., Garrett, D. and Zakharov, V.F. 1999. Global warming and northern hemisphere sea ice extent. Science. **286**: 1934-1937.

Wiig, Ø., Derocher, A.E., Cronin, M.M., and Skaare, J.U. 1998. Female pseudohermaphrodite polar bears at Svalbard. Journal of Wildlife Diseases **34**: 792-796.

WWF. 2001. A Biodiversity Assessment of the Barents Sea Ecoregion. World Wide Fund for Nature, Oslo, Norway. 160 pp.

WWF Climate Change Program

Global warming and climate change pose serious threats to the survival of many species and to the well-being of people around the world.

WWF's campaign has three main aims:

- to ensure that industrialised nations make substantial reductions in their domestic emissions of carbon dioxide - the main global warming gas - by 2010
- to promote the use of clean renewable energy in the developing world
- to reduce the vulnerability of nature and economies to the impacts of climate change

WWF Climate Change Program
International Director
Jennifer Morgan
c/o WWF US
1250 24th Street, NW
Washington DC 20037
USA

Tel: +1 202 822 3455
Fax: +1 202 331 2391
Website: www.panda.org/climate

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversety
- ensuring that the use of renewable natural resources is sustainable

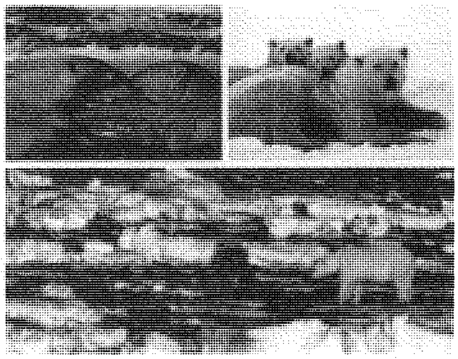
Polar Bear

This icon of the north is losing ground as global warming melts its sea ice habitat

In some areas of their Arctic home, polar bears are in decline. Their drop in population can be traced to another decline: that of sea ice, reduced by global warming. Sea ice is the polar bears' primary habitat and they rely on it for survival. Unless major actions to reduce global warming are taken, two-thirds of the world's polar bears are likely to be gone by 2050.

What are the problems polar bears face?

Climate change: The burning of fossil fuels, the release of sequestered hydrocarbons into the Earth's atmosphere, and extensive agriculture and deforestation are causing climate change, which in turn is causing the biggest threat faced by polar bears: the rapid loss of Arctic sea ice.



Since 1978, scientists have recorded a decline in late summer Arctic sea ice area of 7.7 percent per decade, as well as a decline in the perennial sea ice area of up to 9.8 percent per decade. In some places, a thinning of the Arctic sea ice of as great as 32 percent or more from the 1960s and 1970s to the 1990s has been shown.

More important, ice is melting earlier in the year and reforming later as a result of climate change. Thus, the time available for bears to hunt on the ice and store up fat reserves for the summer and autumn is decreasing. As the periods polar bears must go without food become longer, their overall body condition declines. Habitat loss due to global warming in the Arctic is by far the most important factor potentially affecting the future survival of polar bears.

Oil and gas: Petroleum industry activities in the Arctic are another human disturbance factor stressing bears in their habitat. There are already large oil and gas operations in the Arctic, and the industry is set to expand in the years ahead - especially offshore. Onshore Arctic oil installations are currently found in Russia, Canada and Alaska.

Disturbances due to seismic exploration, construction, transportation and the operation of facilities, as well as contamination from oil spill cleanup operations, may negatively impact polar bears. Furthermore, exploration for oil and gas continues to pollute the atmosphere with carbon dioxide, which is the leading cause of global warming and the loss of the polar bear's sea ice habitat.

Toxic pollution: As top predators, polar bears are exposed to high levels of pollutants through the food chain. Seals, their preferred prey, are often contaminated with the persistent organic pollutants (POPs) that are prevalent in Arctic waters. When a polar bear eats a seal contaminated with POPs, the chemicals become concentrated in the bear's fat and are stored in its vital organs. Bears with high levels of some POPs have low levels of vitamin A, thyroid hormones, and some antibodies, which are important for biological functions such as growth, reproduction, behavior and the ability to fight off disease.

Hunting: The International Agreement on the Conservation of Polar Bears allows the hunting of polar bears by indigenous people using traditional methods and exercising traditional rights. WWF respects the rights of indigenous peoples to harvest marine mammals in a responsible manner. Most hunting is done in a sustainable manner, but overhunting is an additional stress on some polar bear populations. Currently, the hunting of polar bears by nonnative sport hunters is legal in Canada and Greenland.

Historically, hunting was the biggest challenge faced by polar bears. But according to the U.S. Geological Survey, hunting has become less of a stressor. It does remain an important factor as the sea ice retreats, because retreating ice will make once-remote habitats more accessible and more bears will occupy terrestrial habitats. As harsh conditions become milder in certain areas, people will have new access to remote lands and the potential for human-bear interactions will likely increase.

Reducing threats to polar bears in the wild

WWF works in all of the Arctic countries inhabited by polar bears and has participated in their conservation for 20 years. Our strategy focuses on supporting field research, educating the public, and reducing threats to polar bears, their habitat, and their prey. We also call on governments, corporations and individuals to reduce their carbon dioxide and other greenhouse gas emissions, the main cause of warming in the Arctic.

Protecting habitat: WWF has provided technical support to the Wrangel Island Nature Reserve in the Russian Arctic, a place known as "the polar bear nursery" for its high concentration of maternity dens. In 2004, WWF successfully nominated the reserve as a UNESCO World Heritage Site. WWF works with scientists and communities to identify and protect important habitats along the Russian Arctic coast. In the Beaufort Sea, WWF Canada's marine program is working to create a national network of marine protected areas designed to protect species and marine habitat.

As we have for more than two decades, WWF will continue to work to preserve the Arctic National Wildlife Refuge in Alaska. WWF, along with our conservation partners, will also advocate for protecting key polar bear habitats from offshore oil and gas development in other parts of the Arctic.

Supporting science: Around the Arctic, WWF is involved in a variety of projects that are revealing important information about polar bear behavior and distribution, and about the impacts of habitat loss on the species. WWF supports research on the polar bear population in Canada's Western Hudson Bay, where studies have demonstrated the direct relationship between diminishing sea ice and population numbers. Since 2001, WWF has supported the Norwegian Polar Institute's research on polar bears and climate change. On our Polar Bear Tracker website (www.panda.org/polarbears), we track radio-collared polar bears to gather information about polar bear behavior. WWF has also donated satellite collars to the U.S. Geological Survey Alaska Science Center for a similar study in the Beaufort Sea.

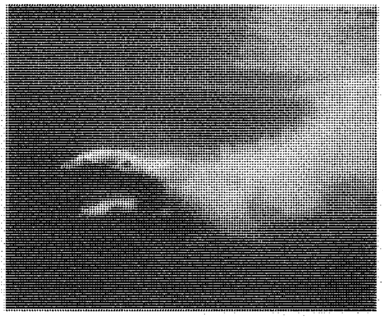
Engaging governments and communities: WWF addresses the protection of polar bears at the international, national and local levels. Internationally, we facilitate cross-border information exchanges in support of the U.S.-Russia Agreement on the Conservation and Management of the Alaska-Chukotka Polar Bear Population. In Russia, we are aiding in the creation of a National Polar Bear Strategy. In the United States, WWF supports the U.S. Fish and Wildlife Service's proposal to list polar bears as "threatened" on the U.S. Endangered Species List, as well as Canada's similar proposal to list the species as "threatened" under Canada's Species at Risk Act.

We also recognize that, because indigenous people continue to depend heavily on marine resources for survival, the participation of native communities is critical to polar bear conservation and management strategies. WWF supports efforts to engage these communities in the necessary science and monitoring and in reducing human-bear conflict.

Focus project – the polar bear patrol: In the remote Arctic village of Vankarem, a small community of 140 on Russia's Chukotka Peninsula, residents have been observing growing numbers of polar bears on land each fall. When a young girl was killed by a polar bear in a neighboring town in early 2006, Vankarem leaders and WWF initiated a "polar bear patrol" to help protect both people and bears.

In its first field season in fall 2006, the experimental Umky Patrol (Umky is the Chukchi word for polar bear) proved to be highly successful. About 180 bears nearly surrounded the village for several weeks, but neither humans nor bears were harmed, thanks to the vigilant patrol members. With scientists providing some guidance, local people also used the opportunity to collect important information about the bears.

Through close cooperation with local hunters, leaders and residents of Vankarem and other coastal communities, WWF has piloted additional projects. In a village survey conducted in 2006, residents expressed widespread support for the creation of a protected area around a large walrus "haul-out" - or resting place - where tens of thousands of walrus concentrate in the fall. WWF worked with local and regional authorities, and in 2007 the Cape Vankarem protected area was approved by the Chukotka regional government.



What can I do to help protect polar bears?

- Reduce CO_2 (and other greenhouse gas) emissions in your everyday life.
- Support and vote for political decisions that aim to achieve considerable and swift greenhouse gas reductions.
- Demand from the Arctic states that human activities there are managed in ways that take into account biodiversity conservation.

Polar bear facts

Population status: There are 20,000 to 25,000 polar bears. They are classified on IUCN's Red List as vulnerable and they are on Appendix II of the Convention on International Trade in Endangered Species.

Where they live: Greenland, Svalbard (Norway), northern Canada, Alaska (United States) and Russia.

Biology: Polar bear fur appears white but actually is transparent. This fur combines with their black skin, which absorbs sunlight, to make them superbly adapted to the harsh Arctic environment, where temperatures rarely exceed 10°C (50°F) in summer and hover around -30°C (-22°F) in winter. Their lifespan is 20 to 30 years. Adult males measure 200 to 250 cm (6.5 to 8 ft) in length and weigh 400 to 600 kg (880 to1,300 lbs). Adult females measure 170 to 200 cm (5.75 to 6.5 ft) and weigh 150 to 300 kg (330 to 660 lbs). Standing on its hind legs, a polar bear is as tall as a small elephant.

Hunting habits: In fall, winter and spring, polar bears dwell near the edge of the pack ice, where they are most likely to find food. In the summertime, as the southern edge of the Arctic ice cap melts, some bears follow the retreating ice north to stay close to prey, while others spend their summers on land, living off body fat stored from hunting. Bears that spend their summers on land always head back to hunting off the sea ice when it reforms close to the coast in the fall.

Reproduction: The mating season for polar bears is March through May; however, pregnancy is delayed so that gestation will last into the winter months. Around November or December, the female digs a maternity den in a snowdrift. Soon she gives birth to cubs - often twins - that take refuge in her thick fur. New mothers cease to feed in winter months and instead live off their stored fat. Their milk, high in fat content, enables the cubs to keep warm and grow rapidly before leaving the den in March or April.

Contact:

Margaret Williams
Managing Director, Bering Sea and Kamchatka
margaret.williams@wwfus.org
907-279-5504

World Wildlife Fund - Alaska Office
406 G Street, Suite 303
Anchorage, AK 99501

worldwildlife.org

Photo Credits: front page, top to bottom: Polar bears touch noses, Canada © WWF-Canon/François Pierrel; Polar bear mother and cubs, Canada © WWF/Steven Morello; Polar bear on ice, Canada © WWF/Steven Morello
Third page: Polar bear diving into water, Canada © WWF-Canon/Terry Domico
© 2007 WWF. All rights reserved by World Wildlife Fund, Inc. 12-07